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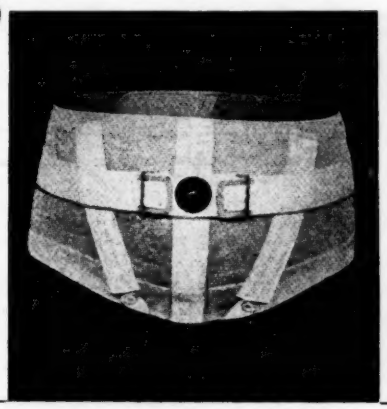

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GASTROSCOPIC OBSERVATIONS IN NEOPLASM*

BY EDWARD B. BENEDICT, M.D.†

GASTROSCOPY has been practiced for many years with rigid instruments, but since the invention in 1932 of the Wolf-Schindler[1] flexible gastroscope its practice has increased rapidly. The flexible gastroscope was first used in this country in 1933 at the Massachusetts General Hospital[2, 3], and is now used in a number of the larger clinics in the United States.

With regard to gastroscopy in ulcer and cancer Schindler[4] concludes in a recent article, "Gastroscopy not only supplements the roentgen examination in the direct diagnosis of gastric ulcer and gastric neoplasm, but it aids greatly in their differential diagnosis. It also furnishes direct evidence of the progress of the benign lesions and of the degree of involvement in cases of neoplasm."

A brief review of the x-ray and gastroscopic findings in the following cases shows the importance of gastroscopy as an aid to the x-ray in the diagnosis and localization of neoplasm.

1. M. M. M. G. H. No. 333930, male, aged fifty-three.

X-Ray, 5/22/34: There was a large crater in the region of the incisura of the stomach, with very marked infiltrative changes around the crater. Reëxamination was requested.

Gastroscopy, 5/24/34: There were numerous areas of bright red submucous hemorrhage. On the lesser curvature one small rounded dark area ½ cm. in diameter, and a larger similar area about 1½ cm. in diameter were seen and were thought to represent benign ulceration. There was no evidence of carcinoma.

X-Ray, 5/26/34: There was a large crater with extreme infiltration around it extending nearly to the greater curvature. The degree and type of infiltration were much more suspicious of malignant degeneration than of simple inflammatory changes around a benign ulcer.

Operation, 6/4/34: A definite ulcer of the posterior wall and lesser curvature of the stomach was felt to superimpose upon the pancreas. The ulcer margins were hard, irregular, and the crater admitted the tip of the finger. The hardness resembled malignant disease. It was thought wise to resect the stomach, as it was felt that the lesion might be malignant.

Pathological Report: Gastric ulcer. No evidence of malignancy.

Comment: Pathological report confirmed the gastroscopic diagnosis of a benign lesion. By gastroscopy a ragged nodular lesion with a dirty base usually means carcinoma. In this case the lesion appeared clean with smooth margins and was therefore thought to be benign.

2. M. M. M. G. H. No. 318232, female, aged forty-nine.

X-Ray, 10/13/34: There was a large ulcerating lesion involving the greater curvature of the upper third of the stomach. The ulcer niche was 2 cm. in depth, but the greater bulk of the lesion was above the ulceration. Findings were those of carcinoma involving the greater curvature.

Gastroscopy, 10/16/34: There was some irregularity of the greater curvature in the upper part of the body of the stomach. The folds in the cardiac portion ran somewhat irregularly and were large and tortuous, sometimes ending abruptly. No niche or definite tumor was seen. The findings are consistent with a marked hypertrophic gastritis; early carcinoma is a possibility.

Operation, 10/17/34: The most careful examination of the stomach failed to reveal the slightest evidence of carcinoma. In view of a very suggestive history of gallbladder disease and a thick, obviously inflamed gallbladder, a cholecystectomy was done.

Comment: It was impossible here to reconcile the x-ray and gastroscopic findings. Certainly by gastroscopy no large carcinoma was seen, and it seemed unlikely that a large neoplasm had been overlooked. Marked hypertrophic gastritis may, however, simulate an early infiltrating carcinoma.

3. E. V. T. M. G. H. No. 341863, female, aged thirty-seven.

X-Ray, 11/8/34: There was an obstructing lesion at the pylorus with sixty per cent retention of barium. Reëxamination after gastric lavage was requested.

Gastroscopy, 12/12/34: The pylorus was well seen. On the anterior margin of the pylorus toward the lesser curvature there was a small, nodular, nipple-like excrescence about 5 mm. in diameter and bright red in color. Peristalsis was very inactive, but the pylorus was seen to contract close to this nodule. The lesser curvature appeared irregular, indurated, and gave a somewhat hard appearance, as though infiltrated. There was no peristalsis passing over it. There was one slightly depressed area in this region, suggesting an ulceration. The greater curvature and posterior wall were intensely red and glistening, with irregular tortuous rugae. The gastroscopic findings are consistent with an infiltrating type of carcinoma and a marked gastritis.

X-Ray, 12/14/34: A lesion 2 cm. in diameter within 1½ inches of the pylorus appeared to be a small polypoid growth without a stalk.

Operation, 12/17/34: One inch from the pylorus on the anterior wall of the stomach could be felt a very small indurated area in the mucosa. A Billroth II resection was performed.

*From the Massachusetts General Hospital.

†Benedict, Edward B.—Assistant in Surgery, Harvard University Medical School and Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 596.

Pathological Report: Adenocarcinoma. Acute and chronic gastritis.

4. A. J. W. M. G. H. No. 343261, male, aged sixty-three.

X-Ray, 2/11/35: The stomach showed a smooth constriction involving its middle two-thirds. Only a thin stream of barium passed through this region. The rugae were completely obliterated, and at one place on the lesser curvature there was a small polypoid filling defect. The findings were those of an annular malignancy involving the middle third of the stomach.

Gastroscopy, 2/13/35: A fair view was obtained of the upper part of the stomach, but the lower half could not be seen, probably because of the annular constriction described by x-ray. The mucosa was nowhere normal, but in its place was an intensely red, fungating, slightly elevated mass, which in some places appeared ulcerating and in other places nodular. The lesion appeared to extend practically to the esophageal orifice and its operability from the gastroscopic appearance would therefore seem quite doubtful.

Operation, 2/19/35: Exploration revealed extensive carcinoma of the stomach, which extended from the cardia to within two and a half inches of the pyloric ring. Involved glands were felt along both the lesser and greater curvatures of the stomach. Even total gastrectomy was found to be impractical on account of the extension of the growth into the transverse mesocolon, a little to the right of the ligament of Treitz. The stomach was so extensively involved that gastroenterostomy could not be done above the growth.

Comment: Gastroscopy here established the extent of the lesion and its probable inoperability.

5. J. F. F. M. G. H. No. 340894, male, aged fifty-seven.

X-Ray, 10/19/34: The lesser curvature of the stomach appeared rather rigid, but could not be palpated. No peristaltic waves passed over the lesser curvature. The distal third of the stomach was narrowed, and no normal rugae could be seen in this region. One or two small filling defects were noted. The findings were consistent with a carcinoma of the scirrhous type, of the pyloric third of the stomach.

Gastroscopy, 10/25/34: No normal mucosa was seen anywhere in the stomach. The antrum was occupied by an annular lesion that appeared infiltrating, but also slightly nodular and protruding. The color was bright red. No normal rugae were seen. In the upper part of the stomach the irregularities were less pronounced and may represent a marked verrucous gastritis, or may mean that the lesion is infiltrating fairly high.

Operation, 10/26/34: The stomach was involved in a very extensive carcinoma which was entirely inoperable. It had grown upward toward the esophagus and backward into the retroperitoneal tissue, with numerous and large glands.

Comment: Here again gastroscopy suggested a very high lesion. Gastroscopy may be particularly helpful when the stomach is inaccessible to palpation, and therefore more difficult for roentgen diagnosis.

6. M. F. B. M. No. 16292, male, aged fifty-five.

X-Ray, 11/23/34: The stomach was unusually high in position, very small, and emptied rapidly. There appeared to be an annular constriction involving about half of the stomach, having the general appearance of scirrhous carcinoma. Palpation was impossible, due to inaccessibility of the stomach. In spite of a negative Hinton reaction, it was felt that syphilis could produce this picture.

Gastroscopy, 11/24/34: Toward the lesser curvature there was a crater about 2 cm. in diameter, the margins of which appeared ulcerating and the edges irregular. No normal mucosa was seen anywhere in the stomach. The entire mucosa appeared studded with nodular protuberances, which seemed to extend almost to the cardia. The appearance was that of a constricting ulceration of the body of the stomach, with infiltration of most of the upper part. The lesion was felt to be malignant.

Operation, 11/30/34: Exploration showed four-fifths of the stomach involved in new growth, which was adherent posteriorly, and extended up to the esophageal opening. The growth was entirely inoperable. A lymph gland along the mesentery was removed for biopsy.

Pathological Report: Metastatic adenocarcinoma.

Comment: Gastroscopy was requested here by the X-Ray Department in order to help exclude the possibility of syphilis.

7. M. K. M. G. H. No. 337960, male, aged forty-five.

X-Ray, 3/21/34: There was a large amount of fluid in the stomach. The rugae were somewhat enlarged. The findings were those of hypertrophic gastritis.

Gastroscopy, 4/5/34: The mucous membrane exhibited a warty appearance which was so marked in some places as to suggest malignant disease.

X-Ray, 6/21/34: Gross distortion of all the gastric rugae was still present. The lesser curvature at the junction of the cardia with the body of the stomach was stiff throughout the examination. A definite lesion was not demonstrable. Reëxamination was requested.

7/7/34: There was an ulceration along the lesser curvature of the stomach extending almost to the antrum. Within this ulceration there was a projection about 1 cm. wide and ½ cm. deep. The rugae in the body of the stomach were definitely enlarged. Considerable fluid was present. The findings were thought to be those of ulcer in the middle portion of the lesser curvature with probably a second ulcer just below it and very extensive infiltration. On account of this extreme infiltration, malignant changes were considered possible.

Operation, 7/11/34: An inoperable neoplasm of the stomach was found.

Comment: Although this case has been previously reported[3], the suspicion of carcinoma by gastroscopy three months before it was suspected by x-ray is worth emphasizing.

8. C. A. M. G. H. No. 337178, male, aged forty-nine.

X-Ray, 5/18/34: There was a large lobulated mass about the size of a fist in the posterior medial part of the fundus of the stomach, consistent with a cauliflower-like carcinoma. The lower portion of the stomach was normal and there was no obstruction of the cardia.

Gastroscopy, 5/22/34: The pylorus was well seen and around it the mucosa was somewhat pale and a little irregular. In the upper half of the stomach, on the greater curvature and posterior wall, an excellent view was obtained of a cauliflower-like lesion of a whitish gray color, with bright red streaks of blood running across it. This appeared to connect with an irregular ulcerating lesion involving the

posterior wall, and extending up practically to the cardia. From the gastroscopic appearance it looks as though cure could only be effected by total gastrectomy, if at all.

Operation, 5/31/34: Exploration disclosed a freely movable mass in the fundus of the stomach close to the esophageal opening and involving the posterior wall and greater curvature. The upper two-thirds of the stomach was removed and an anastomosis made between the antrum of the stomach and the esophagus.

Pathological Report: Adenocarcinoma.

Comment: In this case gastroscopy was of assistance in determining the extent of the lesion and indicating that removal of the stomach up to the esophageal opening would probably be necessary.

9. S. N. F. M. G. H. No. 263438, male, aged fifty-eight.

X-Ray, 11/14/34: The patient was unable to swallow more than two mouthfuls of barium without vomiting. A large carcinoma involving the lower four-fifths of the stomach was demonstrated.

Gastroscopy, 11/16/34: In place of the normal mucosa there appeared a nodular proliferative and in some places ulcerating neoplasm, which was a bright red to gray color in various locations. The lesion appeared to be very extensive and was thought to be inoperable.

Operation, 11/17/34: There was a huge carcinoma of the stomach extending backwards into the tissues behind, so that removal was entirely impossible. A lymph node was removed for biopsy.

Pathological Report: Metastatic carcinoma.

Comment: A gastroscopy in this case correctly suggested an inoperable lesion. Although it is, of course, frequently impossible to be sure by any diagnostic procedure that a given lesion is inoperable, all methods at our disposal should be employed, and gastroscopy in doubtful cases may be of very great value.

10. F. D. F. M. G. H. No. 333523, male, aged fifty-seven.

X-Ray, 8/21/33: Examination showed a lesion which had the appearance of carcinoma of the greater curvature of the stomach about one inch from the pylorus.

11/22/33: Reëxamination confirmed the previous findings. There was fixation of the lower three inches of the stomach, with deformity of the greater curvature and definite evidence of obstruction.

Gastroscopy, 11/25/33: An extensive lesion was seen which appeared to involve most of the greater curvature and parts of the anterior and posterior walls. The appearance was that of extensive ulcerating carcinoma.

Operation, 11/28/33: There was an extensive carcinomatosis, primary in the stomach, with metastases scattered throughout the peritoneal cavity, one of which was removed for diagnosis.

Pathological Report: Metastatic carcinoma.

Comment: Here again gastroscopy suggested a very extensive lesion.

11. C. R. M. M. G. H. No. 340431, female, aged fifty-four.

X-Ray, 10/6/34: Examination showed a carcinoma involving the middle half of the stomach, with question of extension up to the cardiac orifice.

Gastroscopy, 10/8/34: The lower part of the stomach could not be seen, as the gastroscope was obstructed, probably by the tumor. The tumor appeared both ulcerative and proliferative and involved the greater curvature, posterior wall, and lesser curvature, extending, it was thought, to within one inch of the cardia. No normal rugae were seen. The examiner felt that the chances of resection were small.

Operation, 10/10/34: There was a very large carcinoma of the stomach extending up almost to the cardia and backwards around the great vessels. Radical removal was entirely out of the question. A small specimen was obtained for biopsy.

Pathological Report: Metastatic adenocarcinoma.

12. A. S. M. G. H. No. 342303, male, aged fifty-seven.

X-Ray, 12/27/34: Stomach was high and transverse and practically impossible to palpate. The lower half of the lesser curvature was constantly deformed by a dish-like ulceration. Peristalsis was practically absent. X-ray findings were consistent with a large malignant ulceration involving the lower half of the stomach and located mostly on the lesser curvature.

Gastroscopy, 12/31/34: About two inches inside the cardia there was a definite nodule projecting from the lesser curvature. This nodule was somewhat reddened near the base and whitish at the apex. Near this region the mucosa seemed somewhat pale. There was no peristalsis. Below this nodule the gastroscope met with obstruction. The findings were felt to mean an infiltrating type of carcinoma extending fairly high along the lesser curvature.

Operation, 1/4/35: A very high subtotal resection of the stomach was performed for carcinoma of the lesser curvature.

Pathological Report: Adenocarcinoma.

13. E. S. M. G. H. No. 328278, male, aged sixty-five. Pernicious anemia and gastric tumor.

X-Ray, 6/26/34: There was an irregular filling defect showing evidence of craters involving the lower half of the stomach. The duodenum showed a constant deformity, which appeared to be extrinsic. The findings were those of carcinoma involving the lower half of the stomach with extrinsic compression defect of the duodenum.

7/5/35: Reëxamination confirmed the previous observation. There was a large defect in the pyloric end of the stomach.

Gastroscopy, 7/6/34: The entire mucosa was very pale and thin, so that numerous small blood vessels could be seen very well. Normal rugae were almost entirely absent. On the lesser curvature and posterior wall in the antrum of the stomach there was a rounded elevated red lesion, which was fairly smooth in contour, and which was attached to the mucous membrane by a broad base. The lesion appeared to be about 7 or 8 cm. in length, and was thought to be a large benign polyp, although malignant degeneration at the base was considered a possibility. The general appearance of the mucosa was typical of the atrophy seen in pernicious anemia.

Operation, 8/7/34: The stomach was delivered without difficulty. In it could be felt a definite polyp. The stomach was opened, and arising from the posterior wall about one-third of the way up from the pylorus was a long tongue-like polyp, about 15 cm. in length and ulcerated in two places. It was excised with a wide margin around the base.

Pathological Report: Gastric polyp. No evidence of malignancy.

Comment: Clinically this patient had a typical pernicious anemia. The mucosa in untreated pernicious anemia is characteristically very

smooth and pale, and so thin that blood vessels can be plainly seen shining through. After liver therapy improvement in the appearance of the mucosa has been noted[5]. The appearance of the tumor as seen through the gastroscope is shown in the accompanying illustration (fig. 1). From

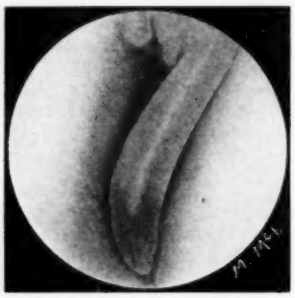

FIGURE 1. Gastroscopic appearance of benign polyp (Case 13).

that appearance alone a benign lesion seemed almost certain, but with a slightly ulcerated and nodular appearance at the base malignancy could not be excluded. As the polyp was turned on itself, its length appeared foreshortened as seen through the gastroscope. Since operation and liver therapy this patient has improved remarkably, and is now in very good health. The mucosa has also improved very definitely both in color and general appearance, so that by gastroscopy there is no longer a definite atrophy, but rather a superficial gastritis.

14. D. J. M. M. G. H. No. 332957, male, aged fifty-one. ? Gastric pathology or extrinsic mass.

X-Ray, 11/1/33: There was marked deformity of the antrum, pylorus, and duodenal loop. The antrum and pylorus appeared to be displaced upward and fixed. The rugae were seen throughout the lower end of the stomach, and faint peristaltic waves passed over the narrowed and displaced antrum of the stomach. Definite x-ray evidence of disease of the stomach could not be demonstrated on two examinations. The deformity was probably from extrinsic involvement.

Gastroscopy, 11/3/33: The mucosa and rugae of the antrum and body of the stomach appeared normal throughout. The pylorus also appeared normal.

Operation, 11/23/33: There was a large mass in the body of the pancreas which seemed to infiltrate the posterior wall of the stomach. The liver contained many metastatic nodules. There were hard, firm glands along the common bile duct, and nodules in the peritoneum and in the pelvis. A gland was removed from the peritoneum for biopsy.

Pathological Report: Metastatic adenocarcinoma.

Comment: Gastroscopy has in several cases, as in this one, been useful in helping to exclude intrinsic disease of the stomach.

Diagnostic gastroscopy is used as a very helpful supplement to x-ray examination in diseases of the stomach. It is not offered as a substitute for the Roentgen ray, since it is admitted that the latter is indispensable in the diagnosis of gastric pathology. In fact, since esophageal disease may be a contraindication to gastroscopy, x-ray study of the esophagus and cardiac orifice should always be carried out as a preliminary procedure. Patients with stomach complaints, even if vague and of short duration, should have early x-ray examination, followed in selected cases by gastroscopy.

A study of the cases presented above reveals that gastroscopy in neoplasm of the stomach may be a very valuable adjunct to the x-ray:

1. In making an early diagnosis of carcinoma,
2. In differentiating benign and malignant lesions,
3. In determining the location and extent of the lesion, and
4. In excluding intragastric pathology.

REFERENCES

1. Schindler, R.: Ein völlig ungefährliches, flexibles Gastroskop. München. med. Wchnschr. **79**: 1268 (Aug. 5) 1932.
2. Benedict, E. B.: Examination of the stomach by means of a flexible gastroscope: a preliminary report. New Eng. J. Med. **210**: 669 (Mar. 29) 1934.
3. Benedict, E. B.: Chronic gastritis; clinical discussion based on gastroscopic examination. New Eng. J. Med. **212**: 468 (Mar. 14) 1935.
4. Schindler, R.: Diagnostic gastroscopy, with special reference to flexible gastroscope. J. A. M. A. **105**: 352 (Aug. 3) 1935.
5. Jones, C. M.; Benedict, E. B., and Hampton, A. O.: Variations in the gastric mucosa in pernicious anemia: gastroscopic, surgical and roentgenologic observations. Am. J. M. Sc. **190**: 596 (Nov.) 1935.

COMPULSORY STERILIZATION

In Germany, the law of July 14, 1933, makes compulsory the sterilization of all individuals with serious diseases (congenital mental debility, depressive manic psychosis, epilepsy, Huntington's chorea, hereditary deafness, hereditary blindness, serious malformations and alcoholism) . . . which, according to medical knowledge, have a great possibility of resulting in deficient offspring. This law does not apply to drug addicts, nor to apparently normal individuals with one or more children with manifestly hereditary diseases. All the cases are submitted for judgment to a sanitary council composed of a judge, a government physician and a practicing physician. The patient may appeal against the decision to a special court which has final jurisdiction. Wegner (1934) believes that 30 per cent of the cases of blindness may be prevented thanks to this law. There are, however, in the author's opinion, certain disadvantages to compulsory sterilization. The main one to be feared is that the patient, apprehensive of being declared to the competent authority, will see the physician as infrequently as possible, and will furnish him with an inexact history, thereby rendering the physician's task more difficult and preventing him from properly treating certain patients. — *Excerpts from the address of Professor Franceschetti before The General Assembly of the International Association for Prevention of Blindness, London, April 5, 1935.*

NEW ENGLAND SURGICAL SOCIETY

SALMONELLA SUIPESTIFER INFECTION WITH SURGICAL COMPLICATIONS*

BY IRVING J. WALKER, M.D.,† SOMA WEISS, M.D.,† AND ROBERT N. NYE, M.D.†

IT is the purpose of this communication to report two instances of B. *suipestifer* infection with unusual clinical course and localized lesions, and to collect from the literature such others as have been reported to date.

The causative organism of this rather rare infectious disease of human beings, the B. *suipestifer,* is accepted as belonging to the Salmonella group, perhaps better known as the paratyphoid group of organisms. It is now agreed that the above-mentioned disease of the porcine species, formerly believed to be the cause of hog cholera in this country, and Schweinpest in Europe, is due to a filtrable virus and that the B. *suipestifer* is a secondary invader or saprophyte.

BACTERIOLOGY

Until quite recently it has been customary, in most American bacteriological laboratories, to employ a relatively simple classification for the pathogenic Gram-negative bacilli. Those fermenting lactose were considered members of the colon bacillus group, whereas those not fermenting lactose were placed in the typhoid-paratyphoid-dysentery group. Further subdivision of the latter was made on the basis of motility, sugar fermentations and specific agglutination tests. Dysentery bacilli are nonmotile and do not form gas with fermentable sugars. Typhoid bacilli also fail to form gas, but are actively motile. All strains forming gas with fermentable sugars were placed in the paratyphoid group. If xylose, a rare sugar, was fermented and if agglutination was obtained with anti-B. *Paratyphosus* A serum, the strain was reported as B. *Paratyphosus* A; otherwise it was reported as B. *Paratyphosus* M. It was realized that many different species gave the same reactions as the latter, but so little was known that further separation was impossible.

Within the past few years many contributions have been made, particularly by White and by Andrewes in England, which have served to clarify our knowledge of this paratyphoid group. More than twenty different species can be identified by specific agglutination tests, other species have been described and probably many more will be reported.

*From the Second Medical Service, Fifth Surgical Service and Department of Pathology, Boston City Hospital.
Read at the Annual Meeting of the New England Surgical Society at Manchester, New Hampshire, September 27, 1935.

†Walker, Irving J.—Clinical Professor of Surgery, Harvard University Medical School. Weiss, Soma—Associate Professor of Medicine, Harvard University Medical School. Nye, Robert N.—Instructor in Bacteriology and Immunology, Harvard University Medical School. For records and addresses of authors see "This Week's Issue," page 596.

This paper is concerned only with the suipestifer-Hirschfeld subgroup, of which there are three very closely related strains: (a) the American type (hog cholera bacillus, diphasic type of White, Group I of Andrewes), (b) the Eastern type (B. *Paratyphosus* C of Hirschfeld), and (c) the European type (monophasic type of White, Group II of Andrewes). Although positive identification should be made only on the basis of specific agglutination tests, a presumptive diagnosis can be made from certain biological reactions. All ferment dextrose, xylose and mannite with the formation of acid and gas, but fail to ferment saccharose and lactose. The American and European types fail to ferment arabinose and can be differentiated one from the other by the fact that the European type forms H_2S in lead acetate agar. The Eastern type ferments arabinose with the formation of acid and gas, but fails to ferment inosite. It can be differentiated from several other species with identical biological reactions only by means of specific agglutination tests.

Instances of isolated and endemic gastrointestinal infection of the human being due to the B. *suipestifer* occur relatively commonly in Europe and to a lesser extent in the United States, especially since the World War.

While undoubtedly the B. *suipestifer* infection of the human being is the result of food contamination, the sources of these infections have remained undetermined and no definite relationship between the human and infected pigs or pork has been established.

Instances of septicemia associated with the B. *suipestifer* are not uncommon and probably account for the localized lesion such as we are concerned with in the following cases.

REPORT OF CASES

CASE 1. E. K., a twenty-three year old, male, Jewish salesman, entered the Boston City Hospital November 11, 1934, complaining of pain in the lower left chest, left shoulder, and also of diarrhea.

On the afternoon of August 20, 1934, after playing golf and tennis, the patient experienced a slight chill. He vomited that evening and perspired freely during the night. There were two chills, each accompanied by a high fever, during the next forty-eight hours. The bowels at this time were constipated. On the second day of his illness he developed pain in the left upper quadrant of the abdomen and in the left chest. The pain was made worse by breathing. At the same time he experienced pain in the left shoulder. There was nothing significant in the past history except for the fact that he had

been treated for a duodenal ulcer, but had been free of symptoms from this condition for one year.

The patient entered the Lucy Hastings Hospital at Manchester, N. H., on August 22, 1934. At this time the positive findings in the physical examination were dulness in the left lower chest over an area both front and back from the seventh rib downwards. The abdomen was distended and tender throughout, but especially over the left upper quadrant where there was also voluntary spasm. Palpation of this region was unsatisfactory for any tumor mass because of the pain produced by pressure.

For the first three days after admission to the hospital the patient had severe chills each day, followed by profuse perspiration. With the chills the temperature rose to 104° or 105°. The heart rate was 80 to 100 per minute. About the third day he developed a diarrhea which lasted for about two weeks. The patient remained in the hospital forty-one days, complaining at intervals of pain in the left upper quadrant of the abdomen and in the left chest.

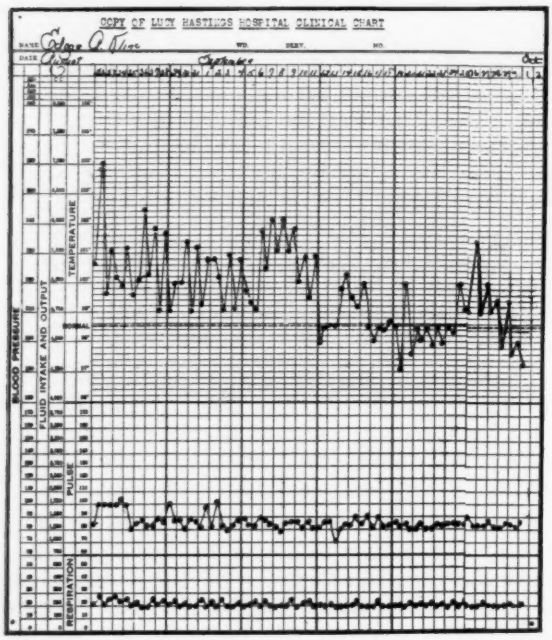

FIGURE 1.

Chart of temperature, heart rate and respiration in Lucy Hastings Hospital.

After leaving the hospital he was fever free and without pain for about ten days. He gained twelve pounds in weight and felt generally stronger. Six days previous to the admission to the Boston City Hospital he experienced a more or less continuous pain of a low grade in the chest just to the right of the sternum in the 4th interspace. This has persisted until now. He had a return of the diarrhea, which lasted two days. About four days previous to his entry to the Boston City Hospital he again experienced the left upper quadrant pain and had a fever of 102° F. Since then he has been running an afternoon temperature. The white count was 11,000 per cu. mm. of blood.

The significant laboratory data were as follows: On August 22, 1934, the examination of the urine was negative except for the presence of a slight trace of albumen. The red count was 4.8 million and the white count was 15,000 per cu. mm. The differential white count contained 86 per cent polymorphonuclear neutrophiles, 11 per cent lymphocytes and 3 per cent eosinophiles. On August 23, the blood culture showed Gram-negative motile bacilli, and blood cultures on future dates showed the same organisms. The Widal test of the blood was negative on several occasions, and a blood test was also negative for undulant fever. On September 8, blood culture were reported as negative for paratyphoid A and B. On October 30, x-ray examination was negative except for a high diaphragm on the left side as shown in figure 2.

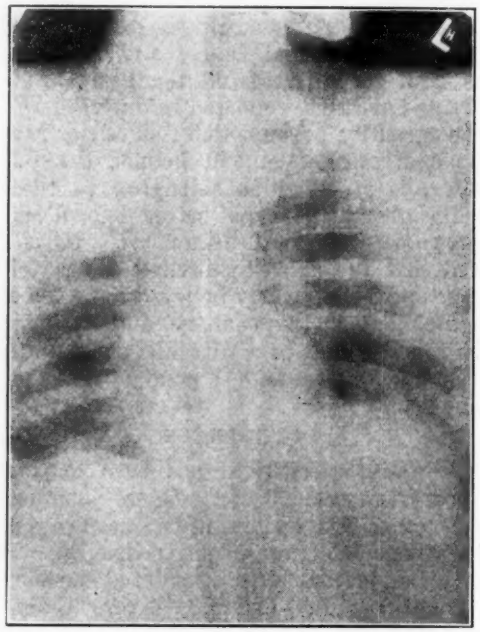

FIGURE 2.

X-ray of the chest, demonstrating high left diaphragm.

On entrance to the Boston City Hospital on November 11, 1934, the patient showed the following pertinent findings: The skin was pale and dry. Over the left side of the chest, posteriorly below the 9th space, there was flatness with absence of tactile fremitus, whispered voice, and breath sounds. The area of flatness was higher in the axilla. Anteriorly there was dulness to flatness below the 5th rib and a definite friction rub was heard on inspiration in the anterior axillary line. Over this area there was tenderness on percussion. The radial pulse was rather small and collapsible and the arterial pressure was 114/76 mm. Hg. The abdomen was distended and tender, but without spasm except that of a voluntary nature in the left upper quadrant.

The culture and Widal test of the blood was negative. The red blood count was 4.3 million and the white blood count was 10,000 per cu. mm. of blood. The hemoglobin content was 61 per cent. Examinations of stools were negative for tuberculosis, motile amoebae and cysts. X-rays of the chest showed the left diaphragm markedly elevated and flattened. The outer half of the diaphragm was fixed. The medial half moved slightly on respiration. The right diaphragm was normal. X-ray examination of the gastrointestinal canal revealed the stomach displaced toward the midline, and the splenic flexure of the colon slightly displaced downwards. Flat x-ray plate of the abdomen (figure 3) showed an indefinite area of density in the left upper quadrant. These x-ray findings were interpreted as being consistent with those of a left subdiaphragmatic abscess.

In view of the fact that the *diagnosis of abscess of spleen of unknown etiology* was made, *operation* under gas-oxygen-ether anesthesia was performed on November 22, 1934. Incision was made in the

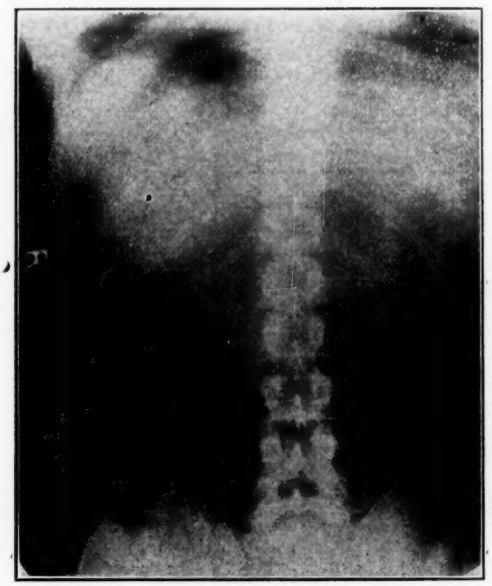

FIGURE 3.

X-ray of the abdomen, revealing an indefinite area of density in the left upper quadrant.

left upper quadrant of the abdomen. Exploration of the latter was entirely negative except for the region of the left upper quadrant. The spleen was considerably enlarged. There were numerous ad-

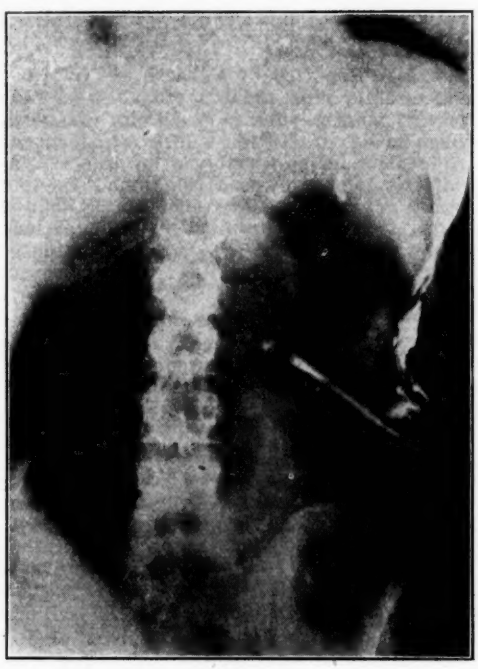

FIGURE 4.

Showing a large postoperative sinus cavity filled with lipiodol.

hesions in the splenic region. On separating some of the adhesions and mobilizing the upper portion of the spleen, an abscess cavity was found posterior to and involving the upper pole of the spleen. This cavity contained about six ounces of a watery pus without odor. A cigarette drain was inserted into the abscess cavity and brought down around the outer border of the spleen and through a stab incision under the left costal margin. The original incision was closed without drainage. The patient was transfused with 500 cc. of citrated blood. The drain was removed on the twelfth day. A catheter was then placed into the sinus tract. Through this irrigations of salt solutions were carried. From time to time, the question arose as to whether the subdiaphragmatic space was being sufficiently drained. However, the profuse discharge diminished and the patient left the hospital on December 27, 1934, thirty-six days after operation, with the catheter still in place. Lipiodol studies of the sinus tract made on December 20, 1934 are shown in figure 4, indicating a large sinus cavity. Similar studies made on February 6, 1935, are shown in figure 5, and demonstrate healing of the cavity, with a narrow tract filled with lipiodol.

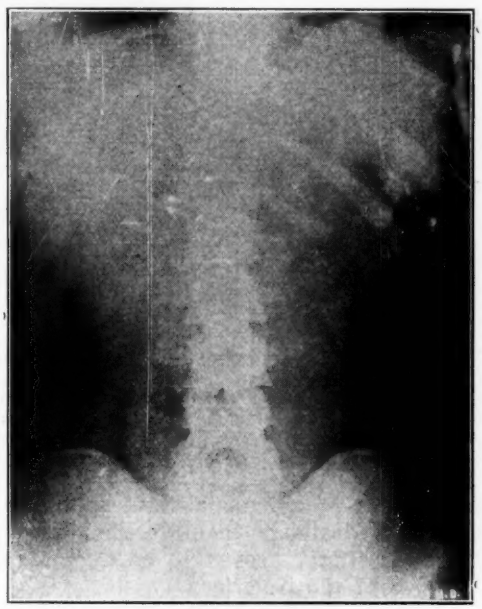

FIGURE 5.

Showing healing of the cavity, with narrow tract of lipiodol in the left upper quadrant.

After removal of the catheter the sinus tract gradually healed. The patient's health has been perfectly normal to date. Figure 6 shows the Clinical chart while the patient was at the Boston City Hospital.

Bacteriological studies of cultures of the pus removed from the abscess cavity demonstrated that the sugar fermentations were identical with those of the American and European type of B. *suipestifer*. H_2S was not found in lead acetate agar, which permitted a presumptive diagnosis of the American type. Bacteria were agglutinated by a 1:2560 dilution of an anti-American type serum, which agglutinated a stock American type strain in a dilution of 1:1280 and a stock European type strain in a dilution of 1:40. The etiological significance of bacilli which were isolated from the patient is proved by the fact that they were agglutinated by a 1:1280 dilution of his serum but were not agglutinated by dilutions of several normal sera as low as 1:40.

The unusual features of the case are as follows: (1) A healthy individual suddenly seized with symptoms of a gastrointestinal nature, but with no history of food poisoning. (2) The clinical course was similar to that of a paratyphoid infection. (3) Blood culture showed a Gram-negative motile bacilli, negative for typhoid and paratyphoid A and B. (4) Clinical evidence of splenic abscess appeared and on surgical drainage the infection, after bacteriological study, proved to be due to the B. *suipestifer* of the American type.

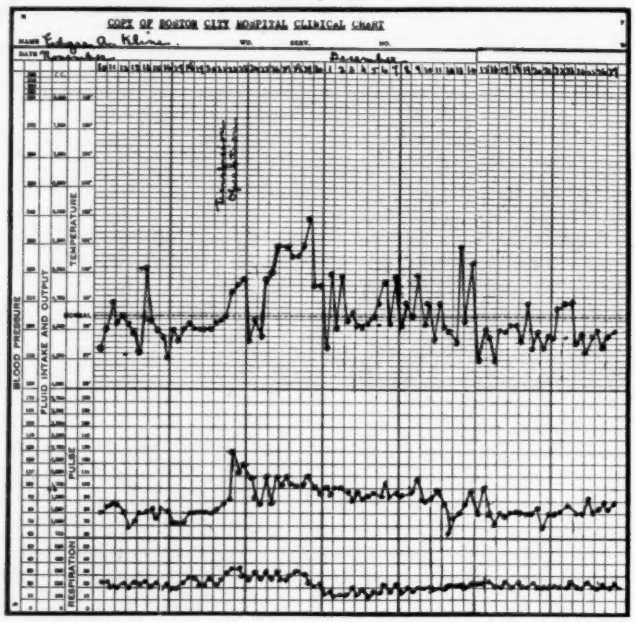

FIGURE 6.
Chart of temperature, heart rate and respiration in Boston City Hospital.

CASE 2. The second case from the records of the Boston City Hospital is as follows: A colored female, aged forty, entered the hospital on June 3, 1934, for treatment of diabetes mellitus. During the course of the hospital stay it was discovered that she had a positive Wassermann test of the blood. Her history also indicated that there was a possibility of a chronic cholecystitis. The Graham test confirmed this diagnosis. On June 5, 1934, a cholecystectomy was done. The gross findings of the gallbladder were not remarkable other than showing evidence of chronic infection. The microscopic finding was that of chronic cholecystitis without stones. Cultures from the gallbladder showed a Gram-negative bacillus.

Bacteriological study of this case also showed sugar fermentation tests identical with the American-European type and also failed to form H_2S. However, the bacilli in this instance were not agglutinated by anti-American type serum but, in view of the biological reaction, the tentative interpretation of a nonagglutinable strain of the American type was made.

The patient has had several subsequent hospital reëntries for the treatment of diabetes but without symptomatology that could be attributed to the proved B. *suipestifer* infection. Agglutination tests for B. *suipestifer* types have not as yet been done on the patient's serum.

CASES REPORTED IN THE LITERATURE

Stimulated by the above-mentioned cases, we reviewed the literature to date with reference to surgical lesions associated with the B. *suipestifer*. As will be seen almost all the cases were in children. We were able to gather the following cases:

(CASE 1.) Reported by Nabarro and White. This was of a child nine months of age who had been ill for two months without a definite diagnosis having been made. Attention was finally focused upon the right shoulder as possibly being infected. Aspiration of this joint showed a thin fluid. Bacteriological study revealed the organism to be that of the American type of B. *suipestifer*. The patient was cured by aspiration of the joint. Apparently this is the first reported case either medical or surgical of the American strain of B. *suipestifer* being found in Europe.

(CASE 2.) The same authors incidentally mention but do not report in detail another case of a joint abscess in a child due to the European strain suipestifer.

(CASE 3.) Kuttner and Zepp report a case of a male Negro child, nineteen months of age, who after complaining of malaise for two months developed a swelling of the right knee. The white count was 28,040 per cu. mm. of blood with 64 per cent polymorphonuclear leucocytes. Aspiration of the joint and bacteriological study of the pus revealed B. *suipestifer* of the European type. The patient was cured by aspiration of the joint.

(CASE 4.) The same authors report a second case of a female, aged five months. The first symptom was that of inability to move the right arm. The right shoulder joint finally became swollen. X-rays showed some destruction at the head of the right humerus. The white count was 22,600 per cu. mm. of blood with 56 per cent polymorphonuclears. Aspiration of the joint showed pus. Study again showed the organism to be B. *suipestifer*, European type. The patient was treated successfully by immobili-

zation of the right shoulder joint. This case demonstrated no febrile reaction during the illness.

In addition, three other instances of localized lesions due to the suipestifer should be mentioned. However, the details regarding the bacteriological study of the cases are not available.

(CASE 5.) Gazzégo and Göttsh report a case of osteomyelitis due to the B. *suipestifer*.

(CASE 6.) Teveli cites a case of pyarthrosis of the shoulder joint due to the same organism.

(CASE 7.) Bruin and Janssen report a case of infection of the knee joint, the organism being the suipestifer.

It is quite evident from the cases observed by us and from those reported in the literature that the surgical lesions developing during the human suipestifer infections are similar in distribution to those found as complications developing during typhoid and paratyphoid disease.

Inasmuch as attention has only recently been focused upon the human infection due to the B. *suipestifer*, it is not unlikely that cases in the past attributed in a general way to the paratyphoid group could well have been due to the B. *suipestifer*, but because of the inadequate bacteriological studies were not accurately classified.

SUMMARY

1. Two cases with localized surgical lesions due to the American type of B. *suipestifer* are reported. In the first case following a *transient bacteremia*, a metastatic splenic abscess developed, causing the clinical picture of left subdiaphragmatic abscess. Surgical drainage of the splenic abscess relieved the patient. In the second patient, B. *suipestifer* was responsible for cholecystitis with the *usual clinical course*.

2. In spite of the fact that both cases reported were adults, suipestifer infections in man have been reported most commonly in babies and children.

3. Unless serological and bacteriological studies are complete, many of the lesions associated with the B. *suipestifer* will be attributed to some unidentified Gram-negative motile organism.

4. Localized surgical lesions associated with the B. *suipestifer* are rather rare and they are similar to the surgical complications of typhoid and paratyphoid fever.

5. Suipestifer abscesses, in the majority of instances, occur probably as the result of septicemia, secondary to a gastrointestinal infection due to contamination of food with the B. *suipestifer*.

REFERENCES

1. Andrewes, F. W.: Studies in group agglutination; absorption of agglutinin in diphasic salmonellas. J. Path. & Bacteriol. **28:** 345 (April) 1925.
2. Bruin, A. D., and Janssen, E.: Hydrops of knee after Salmonella suipestifer infection in girl 13 months old. Maandschr. v. kindergeneesk. **2:** 553 (Aug.) 1933.
3. Gazzego, D., and Göttsh, O.: Orvosi hetil. **78:** 893, 1934.
4. Kuttner, A. G., and Zepp, H. D.: Salmonella suipestifer infections in man; further observations. J. A. M. A. **101:** 269 (July 22) 1933.
5. Nabarro, D.; White, P. B.; Dyke, S. C., and Scott, W. M.: Two cases of human infection by American hog-cholera bacillus. Lancet **2:** 868 (Oct. 26) 1929.
6. Teveli, Z.: Case of pyarthrosis of shoulder joint caused by Bacillus suipestifer infection. Orvosi hetil. **78:** 927 (Oct. 6) 1934.
7. White, P. B.: The Salmonella Group. A system of bacteriology in relation to medicine. Vol. IV, Chap. II, p. 86. His Majesty's Stationery Office, London, 1929.

DISCUSSION

DR. GILE, Hanover, N. H.: Our experience with surgical complications of salmonella suipestifer have been nil, and the literature seems to have few reports.

Park and Williams say, "Quite a number of paratyphoid varieties have been found to be the causative agent in food infection. Three paratyphoid varieties, however, have been the most frequent causative factors. Members of the B. pestis caviae (that is the guinea-pig bug) or Bacillus aertrycke, for one; Bacillus suipestifer and Bacillus enteritidis. These are the three general subdivisions of the paratyphoids that are particularly food-infectious organisms.

The bacilli may invade the blood stream and may find their way to the urine. This is most likely to be so in fatal cases."

Perhaps this is an example of localization in this case after a blood-stream infection and abscess formation in the liver.

Quoting from Ford, "Speaking of intravenous injection of rabbits, a perfect serous exudate is found in the large body cavities with a fibrous deposit on the serous membranes, often containing small hemorrhages. Spleen and liver enlarged and show small circumscribed necrotic foci which may resemble the lesions in tuberculosis. Outspoken lesions of the intestines and patches in the lungs resembling croupous pneumonia may also occur. With large animals, cattle, goats, etc., subcutaneous injection is followed by large localized abscesses and intravenous injection produces severe general reaction."

This whole group of paratyphoid organisms are subject to very evident variation. "Kendrick has observed that variants of Salmonella suipestifer may be derived from smooth and rough forms by the action of bacteriophage." This is additional evidence, to me anyway, that we do get very decided variations in this group of organisms, from motile to nonmotile and even capsulated forms. There must, of necessity, be very distinct variations in the pathogenic proclivities of these organisms.

Quoting from Zinsser and Bayne-Jones, "Paratyphoid B. is probably a more common disease than paratyphoid A. and is more apt to be typhoid-like and severe.

"From the very distinct differences between the clinical manifestations of this disease and the ordinary case of so-called 'food poisoning', it would appear that there must be a very definite human paratyphoid B organism which is conveyed by the same agencies and subject to the same epidemiological laws as typhoid fever. It is difficult to base this on bacteriological evidence since it is often impossible to find any cultural or agglutinative distinctions between organisms isolated from the human blood or bowel, and other bacilli which, from their sources and general reactions, would fall into the groups of hog cholera, enteritidis, etc."

Another sentence on the same page: "It is difficult always to be certain that the strain is a true Bacillus paratyphosus B. and not Bacillus aertrycke or some closely related variety."

Another sentence, "The organism called B. paratyphosus C which was responsible for many cases of paratyphoid fever during the War has been identified by Andrewes and Neave as one of the types of Bacillus suipestifer."

"It was formerly believed that hog cholera was

due to the bacillus which bears this name." "Since then it has been found that this disease is due to a filtrable virus. The constant presence of this organism in animals suffering from this disease, is, therefore, something of a mystery, but is probably due, as Dorset has suggested, to the fact that the organism is a constant inhabitant of the intestine in hogs, and manages to get into the circulation as a consequence of the pathologic conditions incident to hog cholera. A similar association of organisms in blood cultures with diseases of which they are obviously not the primary etiological factor has been observed in other conditions, notably, for example, the Plotz bacillus in typhus fever."

From the above brief review of the literature it can be seen that these groups of organisms are fairly prevalent and from the statements it can be seen that they may and doubtless are the cause of more surgical complications in man than we have been aware, particularly when we consider various cultural characteristics and the difficulty in isolating them.

In each of the past two years in routine examinations of all freshman stools, a considerable number of paratyphoid carriers are found and it may be that more careful cultural methods will produce more cases of the type about which Dr. Walker has given so careful a report in his paper today.

CANCER OF THE MOUTH. CARE OF THE PATIENT UTILIZING PROLONGED ANESTHESIA OBTAINED BY ALCOHOL INJECTION OF BRANCHES OF THE FIFTH NERVE*

BY HUGH F. HARE, M.D.,† JAMES L. POPPEN, M.D.,† AND WALTER B. HOOVER, M.D.†

THE purpose of this paper is to present a method of caring for patients with cancer of the mouth wherein the alleviation of pain is of prime consideration. The alleviation of pain in patients with oral cancer has received too little attention, but we believe it to be an extremely important consideration because the dread of severe pain and the reaction following radon application have become almost as great in the minds of the laity as the fear of pain and deformity associated with surgical treatment. We further believe that if pain were eliminated in every patient, the dread of treatment in the mind of the layman would be diminished and the tendency to seek early treatment would be greatly increased. It is true that most patients with this type of lesion, having presented themselves for treatment, are coöperative and are willing to go through a period of discomfort. Many, realizing the severity of either radon or surgery, hesitate to seek or receive advice.

Since Dominici[1] in 1910 first described the removable radon needle, radiological treatment of cancer of the mouth has gradually become the method of choice. During the past twenty-five years, great improvement has been made in the estimation of adequate lethal dosage for various tumors, in the filtration of undesirable radiation and in the protection of uninvolved tissues. We now feel fairly confident that the lethal dose may be quite accurately estimated for a given type of tumor and also the amount of filtration necessary to prevent a severe grade of reaction.

When we consider that treatment by the most skilled has failed to cure more than one in three or four of these patients with oral cancer, together with the pain and expense involved, it is readily understood why many are discouraged and do not seek advice early.

We believe a definite diagnosis should be established by biopsy without fear of dissemination of the cancer cells, if sealed by cautery or if followed by adequate treatment. When a diagnosis is established, the patient or a responsible relative should be told of his condition and the course of treatment be thoroughly explained to him. This explanation produces a more coöperative patient. In treating oral cancer, more than elsewhere a coöperative patient is necessary. With the patient having a knowledge of his condition and an idea of his course resulting from treatment, we are ready to proceed.

In the Clinic, numerous cases of trigeminal neuralgia and some cases of advanced cancer have been relieved for twelve to fourteen months by an alcohol injection into the second or third divisions of the fifth cranial nerve. It occurred to us that alcohol injection would be a valuable procedure to use before radon treatment in cancer of the mouth. Accordingly, during the past year, we have used this procedure routinely with most satisfactory results. The method of injection will be described later.

THE ADVANTAGES OF PROLONGED ANESTHESIA

1. Prolonged anesthesia permits ambulatory treatment of the patient, obviating the constant, dull, nerve-wracking pain usually accompanying caustic radon treatment. Free of pain, the patient is able to carry on with a portion of his duties without great difficulty.

2. The patients are able to sleep and rest comfortably without opiates or strong sedatives.

3. Oral hygiene is improved. The patient can cleanse the mouth without pain; for this reason, the cleansing is more thorough and secondary infections accompanied by fetid breath less common.

4. The patient can eat without difficulty and without discomfort, except for numbness on the affected side. Without pain and nauseating drugs the appetite remains fair and the loss of weight which usually occurs with treatment has become negligible.

*From the Tumor Clinic Division of the Lahey Clinic.

†Hare, Hugh F.—Assistant Roentgenologist, Peter Bent Brigham Hospital. Poppen, James L.—Associate in Neurosurgery, Lahey Clinic. Hoover, Walter B.—Otolaryngologist, New England Baptist Hospital and New England Deaconess Hospital. For records and addresses of authors see "This Week's Issue," page 596.

5. Radon implantation may be done without further anesthesia. The patient being coöperative, more accurate placing of each radon seed is allowed in and about the lesion.

6. The anesthesia allows the patient to wear a lead shield to protect the uninvolved tissues of the mouth for the first two weeks after radon implantation with little discomfort. The shield may be made larger than could ordinarily be tolerated, the larger shield giving more protection.

The disadvantages of the injection are minor. The patients complain of various paresthesias such as numbness and prickling sensation of the anesthetized side.

CARE OF THE MOUTH

In noninfected cases, no special care of the mouth is indicated before radon implantation. In the secondarily infected lesions, we believe that obvious sources of infection such as carious teeth should be cleared up and that a series of deep x-ray treatment should be given over the affected side. The dose should not be larger than 3000 R units given in fifteen treatments, as we must not injure the skin or subcutaneous tissues when radical resection of the glands of the neck is to be carried out later. During the time of the x-ray treatments, hourly mouth washes of table salt should be used and the lesion carefully cleansed with a moist cotton pledget. This will decrease the infection about the lesion in from four to six weeks' time preparatory to placing the radon. We feel that the use of tobacco has been definitely demonstrated to be harmful and should, without question, be prohibited in all forms, irrespective of the type of treatment to be administered.

Immediately before radon implantation is performed, the mouth should be thoroughly cleansed with seventy per cent alcohol; other antiseptics are unnecessary. After the radon implantation, hourly mouth washes of salt solution are advised for a period of two weeks and then six times daily. Gradually, the frequency of mouth cleansing is decreased as the lesion and reaction disappear.

PROTECTION OF THE ADJACENT TISSUES

A shield made of lead foil, .5 mm. thick, smoothly coated with dental compound, should be prepared before the radon implantation and carefully fitted to the mouth. To be effective the shield must be of sufficient size to protect the structures adjacent to the lesion which is to be implanted with radon. In lesions of the tongue, this shield should be made large enough to cover the mandible on the adjacent side and the roof of the mouth. In cases where the floor of the mouth is involved, it has been suggested by one of us that in order to protect the mandible, it would be wise to separate the gum from the mandible and place the lead foil between the gum and the bone. This can be performed without discomfort due to the anesthesia and will be tried in the next case requiring this protection.

The lead shield should be used for two weeks which is the time of major radon activity and it should not be removed except for cleansing and feeding.

FEEDING

Liquid food of high caloric content is all that is required during the period of intense reaction. Our patients are given such a diet and solid foods are gradually added until the patient is able to take a normal diet.

TYPE AND METHOD OF INJECTION

Lesions of the tongue, the floor of the mouth, the mandible, and lower portion of the cheek are in the area supplied by the mandibular or third division of the fifth nerve. In such cases, an alcohol injection of the third division of the nerve is employed on the affected side.

Lesions which involve the hard palate and anterior three-fourths of the soft palate together with those involving the maxilla or upper cheek lie in an area supplied by the second division of the fifth nerve. Therefore, this division is injected with alcohol on the side affected by such lesions. Cancer involving the areas of both the third and second divisions require injection of each.

Sensation to the posterior margin of the soft palate, the posterior portion of the tongue, the tonsillar fossa, and the pharyngeal walls is supplied by the glossopharyngeal nerve. Figure 3 illustrates the sensory distribution of this nerve. Although we have never performed a neurectomy of the glossopharyngeal nerve to relieve

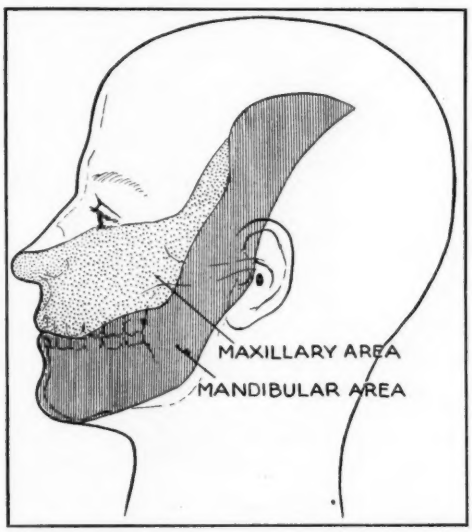

FIGURE 1. Demonstrates the cutaneous anesthesia following the injection of alcohol into both the mandibular and maxillary divisions at their exit from the cranium. The amount of overlapping of the cervical nerves over the ramus of the jaw varies in different individuals.

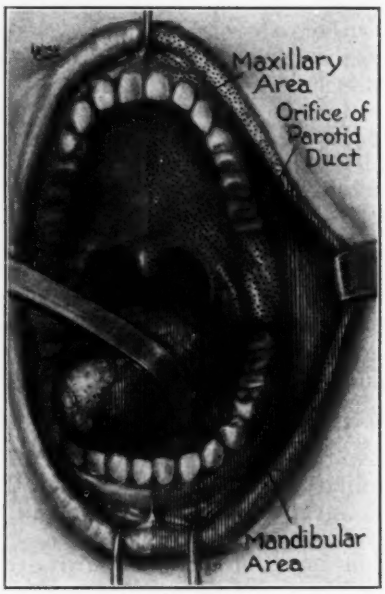

FIGURE 2. The lines indicate the distribution of anesthesia of the third division inside of the mouth. The dots demonstrate the maxillary division. The overlapping which occurs between the glossopharyngeal and maxillary division of the fifth in the region of the anterior pillar and base of tongue varies to some extent in different individuals.

Eustachian Tube
Stippling represents area of anesthesia following intracranial section of the 9th glossopharyngeal nerve.
Base of Tongue
Larynx

FIGURE 3.

pain in treating cancer cases, it has been practiced by others for relief of pain and may well be worthy of consideration in selected cases.

Before alcohol injections are attempted, one must have a thorough knowledge of the skull with relation to the structures around the axis of the nerve trunk. This can be obtained only by dissection of the head and neck as well as by injecting the nerve trunks in cadavers with colored solutions in this way becoming familiar with the bony landmarks and approximate depth of foramina rotundum and ovale. After one has become acquainted with the landmarks, it is important, if possible, to see injections performed by someone who has had experience with the procedure and likewise, do injection on patients under supervision. A most important faculty to develop is that of being able to visualize deep structures in three dimensions.

For the actual injection, a small instrument bag is all that is necessary. This consists of a five cubic centimeter Luer-Lok syringe, two No. 22 gauge needles three inches long, a centimeter

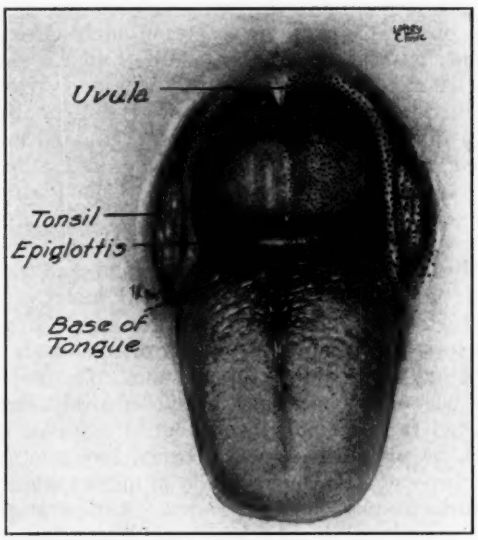

FIGURE 4.

measure, a hemostat, a prepared solution of eighty per cent alcohol containing one per cent novocaine and a little bone wax to use as a marker on the needle. For all injections, the patient is asked to lie flat on the back on a table of sufficient height where the operator can be in an easy position. For a deep injection of the second and third division, the patient's head is turned well over to the opposite side and rests on a sandbag about two to three inches in thickness. We find that one-fourth grain of morphine given an hour before the injection will give us a more coöperative patient.

It is not necessary for the operator to clean up or use rubber gloves in giving injections, a manner to which we have become accustomed. The preparatory routine is as follows:

The sterile injection set is opened and with the sterile hemostat contained in the set an appropriate needle is adjusted to the syringe. If an injection of the foramen rotundum or ovale is contemplated, a bit of bone wax is fixed

around the needle, one centimeter beyond the usual depth at which these structures are reached. Two cubic centimeters of the eighty per cent alcohol mixture is drawn into the syringe, after which the appropriate area on the patient's cheek is sterilized with seventy per cent alcohol. A small piece of gauze dampened with alcohol is placed over the area to be injected in order that landmarks may be palpated through this. The approaches which we use to the foramen ovale and foramen rotundum are essentially the same as those described by Hartell and Harris.

Third division injection. For this procedure, the bone wax marker should be placed on the needle at a distance of 5.5 cm. from the point, thus giving 1 cm. leeway between the marker and the depth at which the nerve should be reached. The syringe with attached needle is taken in one hand while the index finger of the other palpates through the sterile gauze the highest point of the notch on the lower border of the zygomatic process. The patient is then instructed concerning the procedure by being told that there will first be a slight prick as the skin is pierced, after which no great discomfort will be felt until the nerve is entered, when there should be experienced a pain, sharp in character, radiating down the lower jaw to the chin or to the front of the tongue. The patients are told particularly to let the operator know if pain radiates upward into the temple or backward toward the ear, because when the radiation occurs in these directions, it means that the needle has impinged upon the meningeal artery, the eustachian tube or the auriculotemporal branch of the third division.

The sterile gauze is now removed from the cheek and the needle inserted just below the zygomatic notch at the point where a slight imprint will have been left by the palpating finger pressed upon the gauze. The needle is directed slightly upward and backward and at the depth of four and a half centimeters, the nerve trunk may be reached upon the first attempt. If pain radiates correctly, a drop or two of alcohol is injected. This causes a momentary severe pain over the course of the nerve, but it is followed immediately by numbness and cessation of pain. If the nerve is not reached at the usual depth, our practice is to withdraw the needle a centimeter or two and then direct it somewhat forward so as to come down upon the external pterygoid plate. This is an essential landmark because the foramen ovale lies just posterior and slightly medial to it. With disorientation, the needle is again withdrawn somewhat and directed a little backward until the nerve is entered as evidenced by a pain radiation. It may be necessary to repeat this process several times, and also it must be remembered that there are slight variations in the depth at which the foramen lies. In some individuals, it may be reached at slightly less than four and one-half centimeters and rarely at a depth as great as five centimeters from the skin.

When the nerve trunk has been entered and a few drops of alcohol injected, the patient's lower lip near the median line is tested for anesthesia. This should be done with a pin-point and the patient's eyes should be closed. If a fair hit has been made, the sensory loss is almost immediate on this portion of the lip, lower gum and half of the anterior two-thirds of the tongue. Having determined this, we then inject about 1 cc. of alcohol very slowly after pushing the needle gently inward for a millimeter or two during the process, in order to be sure that the substance of the nerve is wholly injected. The needle is then withdrawn and pressure made over its point of entrance with sterile gauze in order to prevent oozing. The patient is now asked to open the mouth. If injection of the third division has been complete, the lower jaw will deviate distinctly toward the affected side.

One further point regarding the injection should be noted. At times when the needle is in the proper position and depth, there is no radiation of pain down the jaw, but severe pain is present at the tip of the needle. This happens in a fairly large percentage of cases. A drop of alcohol may then be injected and it usually brings on radiation of pain followed by numbness indicating that a fair hit has been made. The reason care should be taken in injecting only very small amounts slowly, is that at times the point of the needle enters the foramen ovale unwittingly. If the point happens to be in the subarachnoid space around the ganglion and alcohol is injected, severe reactions as well as permanent damage may be done. If, on the other hand, only a drop has been injected and if the patient develops nystagmus, vomiting or other untoward symptoms, the needle should be withdrawn. The resistance with which the alcohol enters is usually a reliable indicator as to whether the needle is in nerve tissue, provided, of course, that the position and depth are proper as well as the definite radiation of pain. Should the patient complain of severe pain in the ear, as the injection is started, it may mean that the alcohol is entering the eustachian tube or has struck a small branch of the trigeminal which innervates the ear.

Second division injection. The patient is prepared in the same manner as for the third division. The needle is pressed through the skin just beneath the anterior portion of the zygoma and anterior to the coronoid process. The needle passes medially at a forty degree angle anterior to the coronoid process and immediately posterior to the maxillary process. This is

the so-called "anterior approach". As it enters the pterygotergomaxillary fissure which is a narrow opening about .5 cm. wide, it usually strikes the external pterygoid plate behind the posterior border of the maxilla in front. The nerve, as a rule, is reached at 5½ cm. depending, of course, on the width of the face of the patient. It is important that one should not go deeper than six centimeters at any time because of possible injury to important structures, especially the optic nerve. If the external pterygoid plate is struck, it can be used as a valuable landmark, the foramen rotundum lying anterior and .75 to 1 cm. deeper. If the posterior portion of the maxilla is reached before entering the pterygomaxillary fissure, it will also serve as a guide keeping in mind that the fissure in which the nerve lies is founded by the maxilla anteriorly and the external pterygoid plate posteriorly. By gentle manipulation of the needle, the nerve will be reached if no unusual bony prominence makes it impossible. Throughout the procedure, one should have a mental picture of the deep structures. As soon as the needle enters the nerve tissue, a spray of pain will be felt along the course of the nerve. Here, again, only a few drops of alcohol are injected at a time. If complete anesthesia of the upper lip, ala of the nose, and roof of the mouth is obtained, one or two cubic centimeters more is then injected slowly. The most reliable place to test the anesthesia obtained is on the upper lip and the ala of the nose while the patient has the eyes closed. There are no contraindications to alcohol injection with the exception of local infection in the skin or tissues through which the needle must pass.

CONCLUSIONS

The relief of pain during treatment for oral cancer is of prime consideration.

Our method of utilizing prolonged anesthesia, and the method of producing it by alcohol injection of the 2nd and 3rd divisions of the fifth nerve have been described.

In addition to relief of pain, this prolonged anesthesia is advantageous because:

1. It allows the patient to wear the necessary protective shield more comfortably.
2. The mouth is easier to cleanse.
3. The loss of weight during treatment is negligible as the patients are able to eat well during the period of intense radon reaction.

REFERENCES

1. Dominici and De Martel: Radiumthérapie du cancer de la langue. Presse méd. **18**: 155 (March 2) 1910.
2. Horrax, G., and Poppen, J. L.: Trigeminal neuralgia; experiences with, and treatment employed in 468 patients during past 10 years. Surg. Gynec. & Obst. **61**: 394 (Sept.) 1935.
3. Grant, F. C.: Suggestion for relief for the pain from carcinoma of mouth and cheek. Ann. Surg. **81**: 494 (Feb.) 1925.
4. Mixter, W. J., and Grant, F. C.: Relief of pain in carcinoma of face. Ann. Surg. **87**: 179 (Feb.) 1928.

THE PSYCHOGENIC PROBLEM (ENDOCRINAL AND METABOLIC) IN CHRONIC ARTHRITIS*

BY H. ARCHIBALD NISSEN, M.D.,† AND K. A. SPENCER†

IT is with interest that a medical internist addresses a group of psychopathologists. He brings to you for solution some of the clinical observations of the individual, the chronic arthritic. These observations have been checked repeatedly, and today are presented to you for consideration and opinion. Whether cause or effect, accident or coincidence, related or unrelated symptoms and signs of joint impairment without demonstrable infection, toxemia, etc., the single constant is disturbance of the psyche and homeostasis. What is the answer? The practice of medicine, especially "chronic" medicine, emphasizes the well-known fact that no one specialist can succeed without the other. Today this is particularly true of the internist and the psychopathologist, or psychiatrist. Both practitioners realize the importance of the psychogenic and endocrinal (metabolic) factors in chronic disease. The internist, however, in dealing with the psychical, feels he is leaving the realm of pure science and entering that of theory and belief; whereas the psychopathologist, by successful application of therapy along psychological and endocrinal lines, knows he has changed surmise and theory into fact. Years of study of the clinical course of a group of patients with chronic disease, especially that called arthritis, brings one to the conclusion that the psychical affects the clinical picture to a great extent. The internist recognizes this fact but can go only a limited distance in treatment before he realizes that one better equipped than he is needed. In short, if the chronic disease patient is to be treated adequately, a close relationship between internist and psychopathologist must be established and maintained.

The term *arthritis* is applied loosely to any and every complaint referable to a joint.* Actually about thirty-five per cent of patients with so-called arthritis, seen in practice, will prove

*Read by invitation before the American Psychopathological Association, May 18, 1935, in Washington, D. C.

†Nissen, H. Archibald—Member of the Staff and Visiting Physician, New England Deaconess Hospital. Spencer, K. A.—Medical Research Statistician. For records and addresses of authors see "This Week's Issue," page 596.

*Naturally acute traumatic or septic surgical joints are excepted.

to be suffering from that disease. Of this thirty-five per cent a certain number will be found to have a specific arthritis,—gonorrheal, luetic or tuberculous. The remainder, possibly twenty-five per cent of the original number, will be genuine arthritics of unknown etiology. (In a recent study[1] the authors found that sixty-eight per cent of a group of five hundred arthritics were in fact patients with degenerative or tissue changes, and only thirty-two per cent had arthritis, i.e., actual joint destruction. The destruction may be partial or complete, but a certain amount is definite. Tissue changes, contraction or atrophy of muscles, may cause deformity, but arthritis is not necessarily present.) This genuine arthritis has been classified variously as "rheumatoid", "Type I," "infectious", "atrophic", or "arthritis deformans". To some, including the authors, it is simply arthritis of unknown etiology. To others, its etiology is definitely considered as streptococcal in origin. One of the most reasonable exponents of this belief is Hindley-Smith[2]. He considers joint involvement of this type merely one symptom of a definite disease which he calls "chronic streptococcal toxaemia". His description of this condition resembles Coburn's[3] "rheumatic state". Keefer[4] on the other hand does not agree that the theory of focal infection as the etiologic agent in arthritis has been proved. In any case, whatever the etiology of this nonspecific arthritis, its sufferers are the patients for whom the physician can do the least in the way of arresting the disease or improving the general condition. They are the individuals, many of whom following a Life Course C[5] become and remain crippled in varying degrees. They present a tremendous medical, social and economic problem in practically every civilized country.

In the accepted classifications of arthritis, gout is the only type listed as a "metabolic joint disorder". (There are those who consider the degenerative changes occurring in women at the climacteric as being also metabolic in origin.) Many facts suggest that this nonspecific arthritis is another metabolic (endocrinal) disturbance. Cannon[6] has proved the effect of emotional states on the homeostasis, and eventually on the physiology, of the body. He applies the term "homeostasis" to the normal correlation and functioning of the different body systems, and demonstrates the effect on them of uncontrolled emotion, particularly of rage and fear on the endocrinal glands. These same emotions, and in man their intermediates strain, grief, etc., thus disturb the mechanism regulating the distribution of sugar, calcium and other mineral constituents, fluid retention and excretion, blood circulation, and the autonomic nervous system. Obviously, prolonged disturbance of any one of these is likely to produce physiological change.

As early as 1919 Jelliffe and White[7] discussed "bone disorders due to disturbances of nervous functioning". They attributed to "certain hypothyroidisms" the development of a rheumatoid arthritis, possibly by reduced capacity of the individual to react normally to minimal subinfections". They concluded their observations as follows: "Psychogenic arthropathies and arthritides are as yet not definitely established. There is some evidence from the psychoanalytic school to show that unconscious complex reactions may show themselves as bony syndromes. The classical relationship between excessive anger and gout is a case in point. Unconscious sadistic states produce transitory and even chronic arthritic changes." In the sixth edition of their work[8] the same observations are amplified. One reads "The psychogenic discipline is also commencing to show that purely emotional reactions extend deep down in the individual's metabolic processes and must be evaluated in the study of chronic arthritic processes" . . . "It is here considered absolutely imperative that such factors" (psychogenic) "be evaluated in the study of some of the arthritides."

Richardson[9], Stokes[10] and others have observed psychopathy in its relation to physiological changes and organic disease. The authors believe that psychogenic factors play an important etiologic rôle in the production and maintenance of the nonspecific arthritic syndrome, though a review of the literature on arthritis will not show this to be a general opinion. Rivers[11] suggests it. Many writers include psychotherapy in the régime of reëducating a crippled patient. Some men cite worry, strain, etc. as contributory factors, but as a rule do not stress their importance. The psyche must be recognized also as a causative, or activating, factor in joint disturbances other than arthritic,—that is in those confined to capsule and soft tissue, or degenerative joint changes.

The actual association between psychical and physiopathological is as difficult to prove as that of the much debated focal infection and systemic involvement[12]. However, in spite of the incompleteness of most clinical case histories, and the paucity of detail, it is interesting to note how frequently a story of emotional stress precedes, or coincides with, the onset of physiological dysfunction in the chronic disease patient. A follow-up study of a large group of patients will emphasize this point. In a yearly check-up, repeated conversations with the same patient will elicit facts in the emotional life previously undisclosed. No first examination reveals the inner stress which may have been present in the early years of illness. (A relatively short hospital stay, without subsequent yearly follow-up, is of course responsible for the dearth of personal information in the usual hospital record.) In the authors' group of five

hundred arthritic patients, analyzed according to the functional life course each followed[1, 5], eight per cent of Courses A and D ("A" comprised of the best tissue and "D" of the worst), twenty-six per cent of Course B, and thirty-eight per cent of Course C gave a history of recognized psychical disturbance. In other words, twenty-two per cent of the five hundred could be classed definitely as having had sufficient emotional strain preceding the arthritic onset to warrant its being considered an etiologic agent. (It is believed that given proper opportunity a similar story would have obtained from many others.) In a previous article, one of the authors suggested the similarity between the schizophrenic and the arthritic.[13] Hoskins'[14] list of etiologic factors, potentially important in the schizophrenic, applies equally to the arthritic:

Emotional conflicts.
Withdrawal of interest in environment and transfer to phantasy life.
Bad mental and physical habits.
Industrial and social maladjustment.
Structural defects of body.
Defective brain metabolism.
Abnormal endocrine function.
Autonomic nervous dysfunction.
Cardiovascular insufficiency.
Defective gastrointestinal functions.
Liver dysfunctions.
Abnormal mineral metabolism.
Disturbed acid-base equilibrium.
Vitamin deficiency.
Infectious and surgical disease.
Other metabolic disease.

The chief point of *difference* between the two appears to lie in the outlet chosen for the emotional disturbance. The schizophrenic finds his escape from reality through fantasy or dream life; the arthritic through the somatic or physical. In a recent visit to a state hospital for mental diseases not a single arthritic was found among 2200 patients; while in the group of 500 arthritics analyzed only three were diagnosed as having mental disease. The arthritis in these cases was of gonorrheal origin and had left no great residual handicap.

The one hundred and thirteen patients out of the entire group of five hundred with recognized psychical disturbance showed forty-three per cent with nonspecific arthritis, seven per cent with specific arthritis (gonorrheal), twenty-four per cent with tissue changes, causing deformity in some, but without actual arthritis and twenty-three per cent with degenerative changes. Three per cent followed Life Course A (a course in which the patient returns to practically normal activity after recovery from the initial joint disturbance); fifty-two per cent Course B (the patient in this course shows remission and relapse of joint symptoms with no marked disability until the terminal years of life); thirty-eight per cent Course C (the patient in this group shows a drop to a markedly subnormal level of functional activity in from one to seven years and remains at the low level the rest of life); and three per cent Course D (a steady, downhill progression without remission). Another unanswered question is why certain emotionally unstable individuals, if seeking escape from reality, followed Courses A and B, achieving only temporary release, while others followed Course C, securing permanent escape. Was the strain less severe, or the tissue inheritance and acquired intelligence better in the A's and B's than in the C's? The internist can only question; the psychopathologist may go farther and learn the truth.

In all the cases it seems reasonable to believe that the psychical maladjustment preceded the evidences of physiological dysfunction. In some instances the psychical element was alone sufficient to cause a slow, gradual metabolic change, eventually resulting in actual joint or tissue damage; in others, it caused the same metabolic change which was aggravated by individual receptivity (allergic sensitization) to infection, and in others, or perhaps in all, there was the additional factor of poor tissue inheritance, tissue unable to cope with infection; or an inherited mental and emotional make-up too unstable to adjust itself to life's demands. In short, two factors stand out as vital in the etiology of certain arthritides, the mental or psychical reaction and the inherited body tissue. (Possibly both must be considered as inherited tissue if an individual inherits psychical as well as physical components. The psyche appears to be the necessary catalyst to maintain equilibrium between the physiological and functional activity of the body; but if these two activities are out of balance, the psyche is unable of itself to change the imbalance.) Nutrition during the first five years of life, and environmental influences, also play important parts.

REVIEW OF CASES WITH RECOGNIZED PSYCHICAL AND ENDOCRINAL DISTURBANCES

(Twenty-two per cent of the 500 studied)

Observation of psychical and metabolic disturbances do not lend themselves to the usual statistical tabulations, but a few figures are of interest. One hundred and thirteen patients out of the group of five hundred were known to have shown definite endocrinal and psychical disturbances with associated joint reactions, consisting of pain, congestion or swelling. As a rule no acute inflammatory joint symptoms or signs were present. In a few cases they were evident, but accompanying them were other toxic factors. Sixteen per cent of the group were male and eighty-four per cent were female. In the male group, joint disturbances followed marital upheavals, sudden violent shock, or re-

tirement from a long period of strenuous business life (removal of motivation for living without substitution). In the young women definite endocrinal disturbances were manifested by menstrual irregularities (fourteen per cent of the women in the group), definite association between menstruation and increased joint pain or congestion (seven per cent of the group), improvement in joint symptoms during pregnancy with relapse following delivery, etc. Twenty-two per cent of the ninety-five women in this particular group developed arthritic symptoms, or had a flare-up of former joint disturbance, during menopause. In still older women, whose arthritis began years after the menopause, many showed a combination of cumulative infection and exposure, plus a sudden cessation of a former motivation for living, a motivation which had carried them through the previous years of tremendous mental and physical strain.

Fifty-eight individuals (fifty-one per cent of the group) had a history of years of maladjustment, of emotional and mental strain, of early implanted fear, or of shock preceding the onset of arthritis. (Of these, eight carried an additional load of infection.) Six were men; fifty-two women.

Fifty-two patients (four men and forty-eight women) were of an emotionally unstable type. They had shown hysteria, mild phobias, nervous breakdowns and general instability under stress.

In forty-six patients (five men and forty-one women) there was recognized exacerbation of joint symptoms with emotional crises.

Three men and fourteen women showed marked weight fluctuations; eight men and twenty-four women showed tissue changes, manifested by muscle congestion, contractures or atrophy.

Nine patients (three men and six women) improved with modified psychotherapy after other forms of treatment had failed. (This form of treatment had been tried in very few cases.)

In the "C" group, infection was marked in nine cases. These individuals dropped to their low level of functional activity rapidly, while the others, who showed no evidence of any infectious element, reached their low level gradually and more slowly. Also the duration of life after the arthritic onset was shorter when the extra load of infection was present. In other words, where the physical changes developed gradually over a period of years, no infectious factor appeared to have been added to the accumulated psychical disturbance. The addition of infection and other extraneous elements to psychical imbalance, whether long drawn out or cataclysmic, produced an explosive physical response with a rapid production of joint and tissue damage and disability.

One or two illustrative cases will suffice.

A girl of unstable temperament, at the age of fifteen, was in a railroad accident. She developed a "railroad spine", which eventually cleared up. Afterward minor accidents produced transient paralyses. She attempted to be a trained vocalist; found it too exacting and too difficult a career to pursue. She was unsuccessful in love. At the age of twenty-seven, following a street car accident in which she suffered no bodily injury, she developed gradually arthritic symptoms in all her joints. The joints were swollen and painful but not acutely red or inflamed. She was seen first five years after the onset. At the age of forty-two, a condition of complete helplessness was present, fifteen years after the onset. At this time she presented a picture of infection (nasopharyngeal) plus a distorted motivation for living. She apparently obtained definite satisfaction in playing the rôle of a suffering martyr. She will talk about herself for hours as she lies in bed practically immobilized because of ankylosed and destroyed joints. A mother and sister are in constant attendance, having been for years deprived of any normal life or activity which did not center about the patient.

Another patient, female, had been subjected to emotional strain from childhood. Her father deserted the family when the patient was five. The mother and children were deported from the United States back to Poland, where they remained for the next five years; then returned to America. At sixteen the patient went to work in a factory (under poor hygienic conditions). At eighteen, fleeting joint pains were noted. At twenty, she was married to a man whom, after marriage, she discovered to be a manic depressive out on parole from a state hospital. Tremendous emotional strain followed. There was an arthritic flare-up after pregnancy; a second after the next pregnancy; a third after the death of the second child. The husband was in and out of asylums, each parole ending in violence at home. The patient's joint exacerbations coincided with the periods her husband spent at home. She showed marked weight loss. Eight years after the onset she had become entirely helpless; ankylosis was present in every joint except a few fingers. There had never been acute inflammation of joints.

A third woman had been subject to recurrent severe infections all her life. Menstrual flow was always scanty. She was an only daughter. There were strong family ties. Shortly after her marriage both parents became chronic invalids due to cardiovascular disease, one with resultant motor disturbances and the other with cerebral changes. They and two brothers came to live with the patient, her husband and their one child, a daughter. For the next twelve years, the patient's home life was marred by emotional conflict and physical strain. Her susceptibility to infection and endocrinal dysfunction continued to be evident. Arthritic onset occurred at forty-five; menopause four years later. With the latter there was an exacerbation of joint symptoms. Following the death of the parents and lessening of emotional strain, there was a definite subsidence of the arthritic manifestations. A year or more later, relapse followed a new strain.

The patient's daughter was sixteen at this time. The patient attempted to reproduce her own experience, to dominate her daughter as she had been dominated. She capitalized her disability. Five years later, with the rebellion of the daughter, who left home secretly to be married, the patient lapsed into a state of complete helplessness. Rapid disintegration followed. During her arthritic life there were recurrent periods of marked weight loss and gain.

During their various hospital admissions, these patients were studied exhaustively by x-ray, by laboratory tests, and by consultation with otolaryngo-

logical, genitourinary, and gastro-intestinal specialists. Only the nervous system remained unexplored. Only the individual personality, the psyche, was ignored. Only the man trained in psychopathology was unconsulted. The patients responded to no treatment which was tried. The only known form of treatment not attempted was psychotherapy.

PROGNOSIS

Five years or more must elapse after the onset of arthritis before one can make an accurate prognosis. During this time the patient is of course treated along accepted lines. Specific treatment, if indicated, rest, analgesics, supportive, dietetic and physiotherapy are carried on as well as orthopedic measures directed in prevention of deformity. To date, however, intelligent study and treatment of the individual personality has been inadequate. The potential arthritic, or the one seen first in the early stages of the disease, needs this just as definitely as he needs bed rest, diet or vaccines. The psyche calls for the care of a specialist as urgently as do the sinuses, the gastrointestinal or the genitourinary tracts. After the general practitioner has recognized his potential psychotic or arthritic, he must turn for help to the psychopathologist in order to reëducate and readjust the maladjusted psyche before physiologic or pathologic changes develop, before the combined problem of psychical and physiological disturbance becomes established. Too often psychotherapy is relegated to a place of minor importance in the routine treatment of an arthritic patient, or is used only as a means of reconciling an established cripple to his life of inactivity. If this individual has, consciously or unconsciously, reached his state of protected dependence purposively, the application of psychotherapy at this point is too late. On the other hand, if this form of treatment is skillfully used in the prearthritic or early stages of the disease a future generation may see a marked decrease in the number of handicapped, or helpless, arthritics.

This paper contains a plea for help,—help that must come from other than the present avenues of research. It presents clinical observations plus personal follow-up for years of a group of patients with joint complaints, among whom are a certain number with real arthritis. These are not analyzable by the usual resources open to the practitioner of internal medicine. The psychogenic recognition calls for psychopathological help, and from this combination there may emerge,—first, a proved etiological agent; and secondly, a practical therapy.

CONCLUSIONS

1. A certain number of genuine arthritics, in whom no reasonable, proved cause for arthritis can be found, is present in every group of so-called arthritics.
2. Among this nonspecific group will be evident numerous individuals in whom psychogenic and endocrinal disturbance has been dominant before and during the early stages of arthritis. This suggests that the etiology of this syndrome should be looked for in the psychical realm. Definite contributing factors are tissue and psychical inheritance, the first five years of life (nutrition and environment), exposure and infection, exogenous and endogenous. The psychical disturbances found in the group of patients studied were in some instances culminating affairs, or in others, long drawn out, constantly irritating emotional disturbances, which finally reached a point sufficient to disturb the body homeostasis. The individual involved obviously had no conscious recognition of the inside changes in physiology via the autonomic nervous system or endocrinal metabolic imbalance until the joints appeared as definite somatic evidence of such impaired function. Endocrinal disturbance in many was manifested by association between joint reaction and menstrual irregularities or menopause; by tremendous weight variations, by vasomotor changes, etc.
3. Endocrinal and metabolic physiology, plus the inherited psyche, represents an individual's birthright. If the birthright is sound, and the first years of nutrition are satisfactory, the individual will go through life in a philosophical manner without undue wear and tear on the psyche, or joint manifestations. However, if the individual inherits an unstable psyche and has poor nutrition during early life, with or without the addition of infection, he may be able to live and die without actual psychical or somatic disturbance, provided he finds a protected niche in life and escapes emotional and social strain. If, on the other hand, that individual has repeated rebuffs, suffers sudden or prolonged emotional strain, he may well be precipitated into schizophrenia or into an arthritic syndrome.
4. A striking similarity has been noted between a group of schizophrenic and arthritic patients. To date, genuine arthritis and schizophrenia have not been found present in the same patient. The objective of each is to escape reality. The schizophrenic achieves this by the mechanism of fantasy or dream state in its variations, the arthritic by somatic or physical pathways through functional disability.
5. These observations are based on a clinical follow-up of a group of arthritic patients over a period from four to eighteen years. There has been no jumping to conclusions. At the end of five years after the appearance

of joint symptoms a fairly accurate estimate of the future clinical course of the patient can be made.

6. The internist can institute and carry on the physical treatment indicated, and can recognize the potential psychotic disturbance. He is limited in his application of psychotherapy however. A closer relationship between the psychopathologist and the general practitioner is urged as a means of solving the arthritic problem and so lessening the economic and social waste caused by it.

COMMENT

This paper was arranged primarily to present to a group of trained psychopathologists a problem of internal medicine, in which the internist realized his limitation in the treatment of rheumatism, or chronic joint disturbances. To any man in practice, specialist or general practitioner, similar observations of marked changes in motivation of living and emotional reaction in many patients must be apparent. To date, the authors have yet to interview any man interested in rheumatism and allied rheumatic conditions, who did not admit to a certain percentage of failures, patients who had progressed steadily to complete destruction of all joints in spite of every effort. This paper offers a therapeutic aid to the man who will give sufficient attention to the psychical aspects of the chronic arthritic, particularly in the early stages. It is a measure which has been neglected. One of the most recent publications on arthritis[15] does not contain in its index the words psyche, psychiatry or psychogenic. The physician who wishes to utilize psychotherapy has two alternatives, first, to apply it himself, or secondly, to call in a consultant. The first means he must know enough of the function of the thalamus and hypothalamus, the endocrines, body metabolism and psychogenic manifestations, to apply this knowledge in his practice. If he does not not know, he must learn. The second alternative is to recognize his emotionally unstable patient (his potential arthritic) and to call in consultation, and work with, a psychiatrist if one is available. He must select, however, a man broad-minded enough to be interested in applying his specialty (psychopathology), *and no more*, to one group of patients (arthritics in this instance) over a period of years.

REFERENCES

1. Nissen, H. A.: The significance of the life course (or level of functional activity) of the chronic arthritic. Maine M. J. **26:** 181 (Dec.) 1935.
2. Hindley-Smith, J. D.: Chronic Rheumatism and the Pre-Rheumatic State. London: H. K. Lewis & Co., Ltd. 1932.
3. Coburn, Alvin F.: The Factors of Infection in the Rheumatic State. 1931.
4. Keefer, Chester S.: The etiology of chronic arthritis. New Eng. J. Med. **213:** 644 (Oct. 3) 1935.
5. Nissen, H. A., and Spencer, K. A.: Arthritis and systemic involvement as exemplified in group of dead arthritics. New Eng. J. Med. **210:** 147 (Jan. 18) 1934.
6. Cannon, Walter B.: The Wisdom of the Body. New York: W. W. Norton & Co., Inc. 1932.
7. Jelliffe, Smith Ely, and White, William A.: Diseases of the Nervous System. Third Edition. 1919.
8. Jelliffe, Smith Ely, and White, William A.: Diseases of the Nervous System. Sixth Edition. 1935.
9. Richardson, Horace K.: Psychopathy and the general practitioner. New Eng. J. Med. **213:** 787 (Oct. 24) 1935.
10. Stokes, J. H.: Functional neuroses as complications of organic disease; "efflce" technic of approach, with special reference to neurodermatoses. J. A. M. A. **105:** 1007 (Sept. 28) 1935.
11. Rivers, T. M.: The Autonomic Diseases of the Rheumatic Syndrome. Philadelphia: Dorrance & Company, Inc. 1935.
12. Nissen, H. A.: Tonsils as foci of systemic infection. Transactions of the American Academy of Ophthalmology and Otolaryngology. 1934.
13. Nissen, H. A.: Chronic arthritis and its treatment. New Eng. J. Med. **210:** 1109 (May 24) 1934.
14. Hoskins, R. G.: An analysis of the schizophrenia problem from the standpoint of the investigator. J. A. M. A. **97:** 682 (Sept. 5) 1931.
15. Pemberton, Ralph: Arthritis and rheumatoid conditions: their nature and treatment. Second Edition. Philadelphia: Lea & Febiger. 1935.

AN UNUSUAL FRACTURE OF THE LOWER END OF THE RADIUS

(Atypical Colles's)

BY DUNLAP P. PENHALLOW, M.D.*

THE following case is reported as showing what is believed to be a rather unusual type of fracture of the lower end of the radius. This fracture on first inspection appeared to be a typical Colles's fracture, but on closer inspection several dissimilarities, which will be explained more fuily in the description, were noted. The nearest approach to this fracture which I have been able to find is one described in Scudder's Fractures, figs. 714-715. That fracture is described as a T-fracture of the lower end of the radius, in which there is no lateral displacement of the radial styloid, although there is backward displacement of the lower fragment. In the fracture about to be described there are several differences.

CASE: J. F., aged thirty-four, white, engineer. Patient states that while cranking an automobile engine, the engine backfired and the starter handle struck his right wrist causing immediate pain and disability. He was seen shortly after the accident and on first inspection appeared to have a typical Colles's fracture. There was the characteristic "silver fork" deformity and broadening of the wrist. On more careful inspection and on examination certain essential differences were noted. The radial styloid instead of being on a level with or proximal to the level of the ulnar styloid was considerably distal, and in fact was distal to the normal level as compared with the left wrist. The hand instead of presenting radial deviation was in *ulnar* deviation. The lower fragment of the radius was displaced backwards as in a Colles's fracture, and

*Penhallow, Dunlap—Professor, Clinical Orthopedics, Georgetown University School of Medicine. For record and address of author see "This Week's Issue," page 596.

crepitus and abnormal mobility were present. Circulation of the hand and fingers was good and there was no apparent nerve involvement.

An x-ray which was taken at that time showed a fracture line extending through the lower end of the radius with the lower fragment displaced backwards. The lower fragment of the radius, however, instead of being impacted on the outer surface was pulled distally and separated, thus causing the radial styloid to be distal to its normal level. On the mesial edge there was impaction. As a result of this impaction on the mesial border together with the separation of the fragment on the outer border, the hand and wrist were in a position of ulnar deviation. (Fig. 1.)

FIG. 1. Showing displacement downward of the radial styloid and impaction of the mesial border. Backward displacement of the lower fragment is also shown.

Under gas anesthesia the fracture was reduced, the procedure in general being the same as for a Colles's fracture. There was one essential difference, however, since the fracture, after reduction, was immobilized in a plaster cast with the hand in palmar flexion and in *radial* deviation.

FIG. 2. Fracture after reduction, showing complete anatomical reposition of the fragments.

Following the reduction another x-ray was taken which showed good reduction of the fracture and with the fragments in good position. (Fig. 2.)

Convalescence was uneventful and there was a complete restoration of function.

A PROPOSAL FOR A CLINICO-PATHOLOGICAL CONFERENCE*

BY RAYMOND H. GOODALE, M.D.†

THE program of a hospital staff meeting should include something more than the routine reports of deaths. Attendance may be stimulated if some program is outlined from which staff members derive some benefit. To this end we have developed a modified clinico-pathological conference for a part of the program.

In the Massachusetts General Hospital clinico-pathological conference a staff member reviews a case and discusses the differential diagnosis. Usually he is not aware of the autopsy findings which are presented after he gives his clinical diagnosis. In hospitals which are not associated with medical schools, it is difficult to find staff members who are willing to lead a clinico-pathological conference in this manner. In the Worcester City Hospital all of the current service men learn the autopsy findings of a case before the next staff meeting.

In order to teach the staff to correlate clinical and autopsy findings the author has adopted the following plan which has been successful. A committee reviews the deaths and selects four cases for discussion. Usually these are the autopsied cases. One or two of these are selected for detailed correlation of clinical and autopsy findings. At the staff meeting the staff member or interne concerned presents the pertinent clinical and laboratory data, and gives the diagnosis as it was made before the autopsy. The pathologist then gives each member a mimeographed copy of the correlated clinical and autopsy findings. He then reads the correlated data and adds comments. Next the illustrative gross organs are shown, and any microscopic material is demonstrated.

Following is an example showing the set-up used:

*From the Pathology Department, Worcester City Hospital, Worcester, Mass.

†Goodale, Raymond H.—Pathologist, City Hospital, Worcester. For record and address of author see "This Week's Issue," page 596.

WORCESTER CITY HOSPITAL MEDICAL STAFF MEETING

Myelogenous Leukemia

Case of R. B., male; aged fifty-six. Hosp. No. 233504, A145-35
Temp. 99° to 102.5° Pulse 100 to 125 Resp. 28
Height = 67 inches Weight = 175 lbs. Blood pressure 100/60

Autopsy Findings	Clinical Findings
Mouth	
Gums swollen and red; ulcerated only at place where teeth were extracted.	Gums swollen and red; ulcerated only at place where teeth were extracted.
Pericardial cavity	
40 cc. of bloody fluid; fibrinous pericarditis.	Heart sounds distant.
Heart	
Weight 530 Gm. (normal 300 to 360 Gm.). The muscle is pale and flabby.	No murmurs or enlargement. Heart sounds distant; auricular flutter and fibrillation.
Pleural cavities	
100 cc. of straw-colored fluid in each cavity.	Slight dullness at both bases.
Lungs	
Frothy bloody fluid in both lower lobes. No pneumonia.	Slight dullness with crepitant and subcrepitant râles at bases.
Spleen	
Weight 680 Gm. (normal 150 to 200 Gm.). Fairly soft; infarcts.	Palpable one finger below costal margin; no tenderness.
Liver	
Weight 2550 Gm. (normal about 1500 Gm.). Smooth and firm.	Not palpable.
Kidneys	
Weight 680 Gm. (normal 270 to 360 Gm.). Soft, pale, symmetrically enlarged; petechial hemorrhage in cortices and pyramids; orange, gravel-like material in calyces.	Trace of albumen; many hyaline casts.
Bone marrow	
Megakaryocytes diminished. Filled with myelocytes and myeloblasts crowding out erythroblastic tissue.	Blood smear—platelets decreased, 81 per cent myelocytes; 3 per cent myeloblasts. Red count 1,960,000. White count 120,000 to 48,000. Peroxidase stain: 87 per cent granulocytic series, 13 per cent lymphocytic series.
Incidental findings	
Small right hydrocele. Moderate arteriosclerosis of aorta.	

Since the introduction of this system of correlation a year ago we have noted that the internes are stimulated to have the records more thoroughly prepared. Everyone who attends the meetings including the pathologist, is learning the art of correlating the findings at the bedside with the autopsy material.

PREGNANCY IN BICORNATE UTERUS

A Case Report

BY M. W. PEARSON, M.D.,* AND HARLAN W. ANGIER, M.D.*

IN November, 1933, a young woman, Mrs. S., came to my office with the following history and symptoms:

She had skipped two menstrual periods and believed that she was pregnant. For the past two or three days she had experienced some pain and discomfort in the pelvis with a bloody vaginal discharge.

She was a healthy, well-developed woman, twenty-one years of age, no previous pregnancies. On pelvic examination the uterus was found enlarged to about the usual size for three months' gestation, in good position with a somewhat elongated cervix

*Pearson, M. W.—Chief of Staff, Mary Lane Hospital, Ware. Angier, Harlan W.—Visiting Surgeon, Mary Lane Hospital, Ware. For records and addresses of authors see "This Week's Issue," page 596.

and no dilatation of the os. After rest in bed for two or three days the pains and vaginal discharge subsided.

Once or twice during the winter she had a recurrence of the same symptoms which subsided as before after rest in bed.

She lives in a neighboring town and it was only by telephone that I was in communication with her until April, 1934, when she had a more severe attack and came to the Hospital by my advice for observation. In bed in the hospital no more pain or flowing occurred. The fundus of the uterus was then at about the level of the umbilicus, the cervix was still unusually long with no dilatation of the os. At this time no fetal movements were made out and no fetal heart sounds heard.

We could arrive at no entirely satisfactory explanation for her history and symptoms thus far, but she was comfortable and there seemed no indication for any active interference, so she was allowed to go home.

There were no further developments until June 13 about the time of her expected labor, nine months from her last regular menstrual period. At this time there was recurrence of pain so she came to the hospital. It was then evident that there had been no further enlargement of the abdomen since the last examination in April, and x-ray showed the outline of a fetal skeleton at about five months, in the left position, head presentation. The pains soon subsided and the patient was again sent home to await developments. The best we could do for a diagnosis at that time was probable fibroid with pregnancy.

There was no further enlargement during the summer and she remained in the best of health, but became tired of carrying her unsightly abdominal tumor and desired to have it removed if possible. Accordingly abdominal section was decided upon which was performed October 9, 1934 by Dr. Harlan W. Angier of Ware.

Following is Dr. Angier's account of the operation:

A low, left paramedial incision was made. On opening the peritoneum, a firm, grayish-yellow mass was exposed. This was about the consistency of a fibroid, and nothing was felt which might identify it as a fetus. The omentum and transverse colon were attached on the anterior surface; the cecum was adherent to the right posterior surface over an area about five centimeters in diameter; the jejunum was attached posteriorly and drawn very tight so that the impression, on passing the hand behind, was of a broad band running to the duodenum; the bladder was distorted by adhesions to the lower aspect.

The omentum, intestines and bladder were separated with difficulty but little bleeding. The left tube, round ligament and a short distance down the broad ligament were cut. The mass was then clamped off below and removed. A double layer of sutures closed the opening in the side of the uterus just above the internal os. The remaining uterine tissue was about the size and shape of a normal uterus. The wound was closed in layers.

Examination of the mass showed a contracted, dehydrated, and degenerated uterine wall varying in thickness from 0.3 cm. to 1 cm., the thickest portion being at the placenta which was 1 cm. in thickness and attached through its entirety.

The fetus, a male, was dehydrated and quite mummified. There was no sign of decomposition. Its length was 28 cm. Anteroposterior diameter of the head was 9 cm. All parts in apparent proportion and no evidence of deformities.

Convalescence from the operation was without complications of any kind. She was discharged from the Hospital on the twelfth day entirely well, and still very desirous of having a living child if possible.

She menstruated normally November 10, one month from the operation, and again in December and January but not after and it became evident that she was again pregnant. Gestation proceeded this time in an entirely normal manner up to full term and she was delivered October 13, 1935 of a perfectly developed 9 lb. boy.

The labor was without serious complications, of average duration and severity for the occiput right posterior position.

NO INFERIORITY FOUND IN BRAINS OF WOMEN

By The Associated Press

MOSCOW, March 10 — V. P. Osipoff, director of the Bekteroff Institute for the study of brains, reported tonight that there is no scientific basis for the theory that women's brains are inferior structurally to men's.

The report was based on a study of 500 human brains carried on by the institute over several years.

The investigations proved it is impossible to determine from its structure whether a brain belongs to a man or woman, Dr. Osipoff said.

He denounced the theory disproved by the study as a "convenient argument used in some countries to enable the strong to exploit the weak."—*New York Times*, March 11.

DEALERS IN ALCOHOLIC CANDY AND PATENT MEDICINE FIND OPPOSITION IN FEDERAL LAW

Sale of alcoholic candies, which flared up in a short-lived revival following repeal, has been punished in two more Federal jurisdictions, according to the Food and Drug Administration report.

Several manufacturers and shippers of patent medicines have also been fined for having shipped products under labels carrying false statements of effectiveness, and false and fraudulent curative claims for the treatment of the conditions named.—*U. S. Department of Agriculture.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 22121

PRESENTATION OF CASE

First Admission. A thirty-four year old white American ice peddler was admitted complaining of painful swelling of the left hand.

Eleven weeks before entry he developed vesicular eruption on his fingers accompanied by itching. Despite the application of several salves the lesions persisted and spread over the hands. Finally after the institution of intravenous therapy by a physician the eruption in the right hand improved somewhat. Two weeks before coming to the hospital there was an exacerbation of the eruption and many small vesicles became filled with pus. Four days later there appeared red streaks extending up the left forearm. The left hand became painful, red, and swollen. A few days later the patient had malaise, chilly sensations, and some tenderness in the left axilla. The entire arm became quite painful.

Physical examination showed a well-developed and nourished young man. On the skin of both hands, wrists, fingers, and interdigital spaces there were scaly erythematous patches with minute vesicles and pustules. The left hand was more extensively involved and the forearm was slightly swollen, indurated, tender, and reddened to the elbow. The left epitrochlear and axillary nodes were enlarged, soft, and tender. The heart and lungs were negative. The blood pressure was 120/70. A moist scaly eruption was present between the toes.

The temperature, pulse, and respirations were normal.

Examination of the urine was negative. The blood showed a red cell count of 4,370,000, with a hemoglobin of 80 per cent. The white cell count was 11,000, 67 per cent polymorphonuclears. A Hinton test was negative.

The patient was treated with hot medicated soaks with subsequent gradual improvement. An area of tender induration appeared on the medial aspect of the left epitrochlear region, but this subsided shortly afterward. He was discharged on the eighteenth day. His temperature had never risen above 99° throughout the hospital stay.

Second Admission, five days later.

On the day after discharge the patient again developed a tender, reddened, hard swelling in his left forearm. On the following day he complained of pain and tenderness in the muscles of his calves. Walking was so painful that he went to bed. The next day he had a rather severe headache and some chilly sensations. The pain in the leg muscles now extended to his hips. On the day before entry he complained of vague pain in all extremities and his back. A physician was called who found the patient's temperature to be 101°. Later he became nauseated and complained of a sensation of great weight in his chest.

Physical examination showed the patient to be slightly lethargic. The vesicular rash previously described was present on his hands and feet and there was slight edema of the hands. The skin of the left forearm was mottled, red, and there were several blotchy areas on the upper arm. The eyelids were edematous. The throat was slightly injected. There was tenderness elicited in all muscles of the back, extremities, and neck. Maximal tenderness was thought to be present along the nerve trunks and there was questionable thickening of the left ulnar nerve. The neck was slightly stiffened and motion was painful. A bilateral Kernig sign was elicited. The biceps jerks were present and equal. Knee jerks were sluggish and the ankle jerks were absent.

The temperature was 103°, the pulse 100. The respirations were 24.

Examination of the urine showed a slight trace of albumin but was otherwise negative. The blood showed a white cell count of 23,000, 80 per cent polymorphonuclears, 6 lymphocytes, 3 monocytes, 9 myelocytes, and 2 eosinophils. The stools were negative. A lumbar puncture showed an initial pressure of 90. There were 5 lymphocytes per cubic millimeter. An ammonium sulphate test showed a questionably positive reaction. The total protein was 52 milligrams per cent. The spinal fluid sugar was 73 milligrams per cent. A Wassermann test was negative. Blood cultures were repeatedly negative. Agglutination reactions for the typhoid-dysentery group were negative. A muscle biopsy was negative for trichiniasis and vascular disease. The phenolsulphonephthalein excretion was 95 per cent in two hours. The nonprotein nitrogen of the blood was 29. The chlorides were equivalent to 95 cubic centimeters N/10 sodium chloride. The serum protein was 5.7. An electrocardiogram was negative.

X-ray examination of the chest was negative.

The patient gradually improved generally and the temperature, with daily oscillations, slowly returned to normal at the end of a week. He continued to complain of pain in the left arm, where tenderness was found over the ulnar

nerve with hypesthesia over its cutaneous distribution. A week later the patient had no complaints but had occasional rises of temperature to 102°. The white blood cell count remained elevated between 15,000 and 20,000. Shortly afterward he developed pain and tenderness in the left arm, leg, and side of the abdomen. On the following day there was a flare-up of the skin eruptions over both arms. Thereafter he improved and complained only of some vague joint pain. Frequent exacerbations of the generalized aches and fever were usually associated with ingravescence of the skin eruption. At the end of five weeks the patient developed tender subcutaneous nodules about two millimeters in diameter on the calves of his legs. These were transient. Eleven days later the patient requested leave to go home, and he was discharged although there was no evidence of any improvement.

Final Admission, two weeks later.

Shortly after discharge the patient had stabbing pain in the left arm and right leg. The distress was sufficiently severe to require morphin for relief. He had several chills and his temperature remained fairly constantly elevated.

Physical examination showed an emaciated, gaunt, drowsy man moaning with constant pain. There was marked tenderness over all the extremities and slight tenderness of the abdomen and costovertebral angles. There was moderate brawny edema of the left hand and both feet and ankles. The mucous membranes were dry. The heart and lungs were negative. There was no evidence of any active skin lesion. The previously described skin nodules had disappeared.

The temperature was 102°, the pulse 110. The respirations were 24.

Examination of the blood showed a white cell count of 33,000, 87 per cent polymorphonuclears, 11 lymphocytes, 1 mononuclear, and 1 eosinophil. The platelets were normal in appearance. The stools were negative. The blood cholesterol was 137 milligrams per cent. The uric acid was 2.03. Again repeated blood cultures showed no growth.

A flat x-ray film of the abdomen showed a few areas of calcification above the crest of the ilium which were believed to be calcified glands. The left lobe of the liver appeared to be slightly enlarged. The chest was negative. The extremities showed some fleck-like atrophy in the region of both wrists and bones of the feet.

A week after admission the patient improved somewhat although his temperature remained slightly elevated and the white blood count remained in the vicinity of 23,000. Four days later the patient had severe right upper quadrant pain which was aggravated by inspiration. There appeared dullness, râles and bronchial breathing at the right base. The blood pressure was 150/100 and a friction rub was heard over the precordium. The temperature was 101°. X-ray examination showed slight enlargement of the heart and cloudy dullness in both lung fields, less at the periphery and in the apices. He was considered to be moribund, but four days later had improved markedly although he complained of some substernal oppression. Dullness was now found in the left lower chest in addition to persistent signs on the right. The respirations were 42 and a friction rub was still heard over the precordium. On the twenty-third day his face became quite cyanotic and the neck veins were markedly distended. The respirations were characterized by expiratory grunting. The chest signs were unchanged. Another x-ray showed change in the previous areas of dullness which were now practically confined to the upper lung fields. A well-defined rounded area of density was present in the left upper lung and there was some fluid in the left pleural cavity. The heart and upper mediastinal shadows were slightly increased in size. A week later the left arm became blue, cold and edematous. A feeble radial pulse was felt on this side. The left external jugular vein was felt to be prominent, firm, and cord-like. There was marked pitting edema of the ankles. The heart sounds were weak. The temperature was 99°, the pulse 120. Three days later purpuric spots appeared in the skin of the chest and the arms. The left arm became somewhat warmer and there was diminution of its swelling. Corneal ulcers then appeared in both eyes and he began to sink rapidly. He died on the thirty-sixth hospital day, three months after his first entry.

Differential Diagnosis

Dr. William D. Smith: I would like to know more about this man's occupation. I would like to know if he drove a horse, if he took care of the horse, or if the horse had a cold.

Eleven weeks before entry he developed a vesicular eruption on his fingers accompanied by itching. He might have had a dermatitis. He might have had a fungus infection. At least he had it for eleven weeks before he came into the hospital.

I do not believe the eruption improved on account of the intravenous therapy.

Of course he might have had a skin lesion and it might have become secondarily infected but when it says "many small vesicles became filled with pus" it makes one think that they were pustules from the beginning rather than lesions becoming infected from some extraneous source.

He had a lymphangitis, also a systemic reaction to his infection, whatever it was, and probably glandular enlargement in the axilla.

"On the skin of both hands, wrists, fingers, and interdigital spaces there were scaly ery-

thematous patches with minute vesicles and pustules." I am guessing that the skin lesions and the pustules were part of the disease.

He apparently had athlete's foot. I have heard Dr. Swartz say that while this type of fungus on the foot may cause a lymphangitis it does not ordinarily cause a systemic infection, that is a fungus septicemia. It still leaves it open as to whether this eruption on the hand was fungus or not.

Dr. Oliver, does the fungus eruption cause pustules ordinarily?

DR. E. LAWRENCE OLIVER: I think when there are pustules it is probably secondary infection and staphylococcus. Vesicles as well as pustules make culture media.

DR. SMITH: I cannot draw any conclusions from the blood examination. We cannot say that he had a leukocytosis, although the white count is a bit more than ten thousand.

"An area of tender induration appeared on the medial aspect of the left epitrochlear region but this subsided shortly afterward." I cannot interpret that. Apparently it was not an epitrochlear gland but an indurated area in that region. If this were a pyogenic infection it would be extraordinary to have that amount of lymphangitis and that glandular involvement without some fever and increased white count.

The tenderness elicited in the muscles makes one think of periarteritis nodosa. The nerve tenderness and the thickening of the ulnar nerve make your mind jump to leprosy but it jumps back again very quickly.

"The neck was slightly stiffened and motion was painful." He had meningeal irritation at least, if he did not have meningitis.

The white count in the second admission is just a bit high. The few myelocytes do not particularly interest me. He did not have eosinophilia, which does not rule out periarteritis nodosa or other diseases where we would expect an eosinophilia.

The spinal fluid sugar is just a shade high and suggests that he certainly did not have a pyogenic meningitis.

The blood cultures were negative. That is interesting because if this were a pyogenic condition we would expect repeated blood cultures to show something. On the other hand, if this were a fungus infection or glanders we might have repeated cultures and quite likely not get a positive finding.

"A muscle biopsy was negative for trichiniasis and vascular disease." I suppose there again they are thinking of periarteritis nodosa.

This illness has been characterized by marked remissions and exacerbations when he seemed to be pretty well and then pretty sick.

The left hand and arm seem to bear the brunt of the local reaction, whatever it may be.

I was hoping there would be a running nose so that we could discuss glanders.

The skin lesions in this exacerbation are gone and the previously described skin nodules are gone.

"Repeated blood cultures showed no growth." Again I think that makes it more doubtful if this were any of the ordinary pus-forming organisms.

"Four days later the patient had some right upper quadrant pain which was aggravated by inspiration." Was that pleurisy, Dr. King?

DR. DONALD S. KING: I think so.

DR. SMITH: I think it might be from the subsequent story.

"A friction rub was heard over the precordium." (The last case I discussed had a friction rub on paper but none at postmortem.)

We might think he had pericarditis, lung changes, and perhaps involvement of the mediastinal glands. He has pulmonary involvement certainly. What sort we do not know. My guess is that he has some venous thrombosis in his central vascular system or near it. I am still not willing to make a diagnosis of pneumonia. These changes jump from the lower lobes to the upper lobes in the most discouraging and distressing fashion.

The x-ray description of that "well defined round area of density" again makes one feel that the lung changes are very likely metastatic and not terminal pneumonia and that the lung pathology is part of the original disease whatever that may be.

At first glance I thought he had an arterial obstruction of the left arm but he has no business having edema. The arm should not be edematous if he has arterial obstruction so I do not know whether it was arterial or venous. If it was arterial the arm should be white and not edematous; instead of that it was blue, edematous and cold.

He may have a thrombosis in the jugular vein.

Of course the easiest thing to say is that he had a dermatitis, secondary infection, a lymphangitis, and a septicopyemia.

Did he have glanders? With glanders we could have papules and pustules. We can have a chronic glanders that is difficult to diagnose. You may get with glanders, pneumonia and meningitis. Could these swellings be farcy buds that did not break down? In glanders you expect some to break down somewhere. Furthermore, if it was glanders we probably would have something in the story about the Strauss test and the malein test and the complement fixation test. Still I think glanders could cause this picture. Then leaving that we drop into the other queer things, the mycoses. Of course,

it could not have been actinomycosis. Could it be streptothrix? The only thing I know about streptothrix is that it could cause lesions everywhere and it has been confused with glanders. I believe streptothrix could cause all the lesions we have here, but my feeling is that streptothrix is much slower with the patient sick for months or years so I think I will let that go by the board. How about periarteritis nodosa? I do not see that we have anything very definite to make that diagnosis on. We do have nerve tenderness, muscle tenderness, visceral lesions, and lung pathology, but no eosinophilia. I think you can have skin lesions with periarteritis nodosa but I do not know what kind. Can you tell us about that, Dr. Oliver?

DR. OLIVER: I have never seen any.

DR. SMITH: Periarteritis nodosa is a very rare condition, however; but I believe it can cause this picture.

When you come down to the fungus infections I have heard Dr. Swartz say that the type that gives athlete's foot, which this man apparently had, does not cause systemic infection, but the kind that causes systemic infection is more the yeast or the yeast-like forms. Could this have been a fungus, a yeast infection? You can get skin lesions. You can get papules, involvement of the lung, pleura and pericardium from yeast. Again, my feeling is that the yeast infections are of a low grade, that they are not associated with high leucocytosis unless there is secondary infection. Of course, the inability to get blood cultures would fit in with yeast infection. I am inclined to think that the central nervous system story might fit in with the yeast infection. I believe again that *fungus infection, periarteritis nodosa,* or *glanders might cause this picture* and *I have not much idea which.* It is interesting that he had his skin rash eleven weeks before he became sick. If he had an infection, if he had glanders, one would think that he would have more than the simple skin infection before the end of eleven weeks, but a glanders could begin as a very chronic disease and then it could jump into an acute phase. Just for the sake of saying something, I will have to say that any of these conditions could do that, but I will put fungus infection first, glanders second and periarteritis nodosa third.

CLINICAL DISCUSSION

DR. CHESTER M. JONES: I saw this patient for three months off and on and I am perfectly sure at the end of that time we were still in doubt. We considered all the conditions Dr. Smith has named except glanders and I do not think anyone considered that as a possibility. I think that is an interesting suggestion.

We came back finally to the possible diagnosis of periarteritis nodosa which seemed to be more capable of filling the bill clinically than any other. We did a biopsy because we thought we felt nodules but it was negative.

There are one or two interesting features about the case that I can recall. One was apparently that he did have a cellulitis in his arms following the onset of this skin infection on one or two occasions, and we thought he had an infection from scratching the skin secondary to the fungus infection. We were never able to prove any of these diagnoses. Of course the terminal events were obviously secondary to some obscure cause and we did not think they affected the primary diagnosis in any way. My recollection was that at the end we felt that the most favored diagnosis was still that of periarteritis nodosa. He had several times during the acute exacerbations the findings that accompany peripheral neuritis. There were times when he had a good deal of pain, and it seemed as if he had an active rheumatoid arthritis, but it was obvious that that could not fill the bill, and I must admit we were totally in the dark as to any accurate diagnosis.

Dr. Ragle saw him in August and he suggested that he might have periarteritis and during the subsequent three months the question came up again and again, Was that not the most logical diagnosis we could make?

DR. OLIVER: I think the skin eruption at the start suggests a possible fungus, but was possibly a dermatitis from external origin. The fungus origin was never proved although we occasionally get more or less generalized eruptions, especially from some of the yeasts, with death following, though such occurrences are very rare. We have had one or two such cases. We had one many years ago undoubtedly due to yeast. It seems to me that the most likely possibility is that he had a secondary pus infection on top of a fungus infection. The pain that he had at various times coming on suddenly suggests to me small repeated showers of emboli.

DR. AUBREY O. HAMPTON: The fleck-like atrophy described is just the bone atrophy of disuse. The same changes are seen in the hands and feet. I do not see any abnormality in the joints. In the abdomen on the left side the splenic flexure of the colon reaches the diaphragm. I do not believe we can say that this is the left lobe of the liver and be certain, it is probably the outline of the gas-filled colon as it crosses the abdomen. Here is the calcification described in the right lower quadrant. The bones as far as I can see are normal.

This is the first chest examination taken in the summer. It is a portable film and shows practically nothing. There might be a little diminished radiance of the left lower lobe. About two months later the chest is still clear. There is only six days between these two films,

and there is a marked change in the chest. I do not believe these shadows represent chronic disease. I believe these films rule out chronic lung infection completely. A chronic infection such as a parasitic one would not produce this picture. The only fungus infections I have seen have been chronic. This film of the same patient though taken nearly a month later has changed very little and this finding is rather contradictory. This is the early film and shows these round nodules which were described. Here is one which is perfectly round, smooth and sharp, and another nodule is seen on the right side.

We think of any sharp area of consolidation in the lung as being more or less chronic. We have something here that is acute in six days and looks both chronic and acute within three weeks. There are only two or three lesions which are chronic. I think of edema of the lung, sudden changes in the heart as causing part of it, though it should have disappeared. Perhaps he is in the same condition here as there. Another attack of whatever happened to his heart to produce pulmonary edema may have occurred but that would not explain the round nodules, so I would have to say he had something in the way of metastatic lesions in the lung with diffuse edema.

Clinical Diagnoses

Peripheral neuritis?
Periarteritis nodosa?
Rheumatoid arthritis?
Pericarditis.
Thrombosis, left subclavian vein.
Bronchopneumonia.

Dr. William D. Smith's Diagnoses

Generalized fungus (yeast) infection?
Glanders?
Periarteritis nodosa?
Venous thrombosis, ? left jugular, ? mediastinal veins.

Anatomic Diagnoses

Probable periarteritis nodosa, healed stage.
Infarction of the lung, liver and kidneys.
Aneurysm, miliary, of the left ventricle.
Mural thrombi, right auricle.
Pericarditis, acute fibrinous.
Pleuritis, acute serofibrinous, bilateral.
Thrombosis, left subclavian vein.

Pathologic Discussion

Dr. Tracy B. Mallory: The differential diagnosis in this case really should begin after the autopsy findings have all been presented. I will describe them and then we can start in again.

We found a very large amount of gross pathology. The left subclavian vein and the jugular were completely thrombosed but no arterial occlusion was found in that arm. The heart was quite peculiar. The valves were entirely negative. The left auricle contained five separate polypoid thrombi. At the apex of the left ventricle was a minute aneurysmal dilatation only half a centimeter in diameter. The aorta and larger arteries, including the chief divisions of the coronaries, showed no evidence of atheroma. The pulmonary arteries, however, were filled with thrombi and there were numerous areas of infarction in the lung. There was fibrinous pericarditis and bilateral pleuritis. The liver and spleen were both normal in size but when we cut into the liver we found innumerable wedge-shaped areas, the largest about one centimeter in diameter, which were densely red and looked like infarcts. The spleen was totally free from infarcts, whereas the kidneys were practically full of them, twenty or more. That comprises most of the significant gross findings and I could not put this together into any picture to which I could give a name.

We hoped that the microscopic examination would throw light on the condition but while it gave us a good many more findings, the diagnosis is still pretty questionable. Sections from all the organs in the body which were examined, except the spleen, show extensive pathology in the blood vessels. The great majority of the vessels involved vary in size from two millimeters down to about one-tenth of a millimeter, but in the left arm the brachial artery and vein were affected. The arterioles are negative. The changes in the vessels are on the whole very uniform. There is a marked thickening of the intima which narrows many of the small arteries to a quarter, a fifth, even a tenth of normal. A fair number are completely obliterated by old acellular fibrous tissue which shows very little tendency to recanalization. In a certain proportion of the vessels the process is not limited to the intima. The internal elastic lumina—for the most part well preserved—will be destroyed and the muscle cells of the media will have been replaced by fibrous tissue. Occasionally where this has occurred there is a slight aneurysmal dilatation. Very rarely is there any periarterial fibrosis. The veins for the most part are uninvolved, but some of the portal radicles are obliterated and the brachial vein from the left arm is nearly obliterated. The brachial artery at the same level shows considerable fibrous intimal thickening and some increase in collagen in the media. A striking feature, in contrast to the acute parenchymal degeneration, is the evident chronicity of the vascular lesions. The majority look months old and even the most recent, in the kidney, show complete organization which must be of several weeks' duration. It does not seem probable that we have missed

more acute lesions since we have very carefully studied over fifty sections.

At this point I suggest that we begin our differential diagnosis again. We are dealing with the chronic, perhaps with the healed stage of a diffuse arterial disease. It is not embolism because no source for emboli in the major arterial circuit was found and embolism of such a diffuse character would certainly have involved the spleen. In contrast to malignant hypertension the disease spares the arterioles. It differs from Buerger's thromboangiitis obliterans in concentrating its effects upon the smaller arteries of the viscera rather than the larger vessels of the extremities. Syphilis must, I suppose, be mentioned though the evidence that it ever produces peripheral vascular disease is far from convincing and in this case the negative Hinton and Wassermann tests are adequate to exclude it. What have we left? A large group of vaguely defined disorders of the blood vessels and one other disease entity—periarteritis nodosa. Two attempts to make this diagnosis by biopsy were unsuccessful but that is not an uncommon experience when no subcutaneous nodules are present to guide one's scalpel. No characteristic lesions of the acute stage were demonstrated at autopsy. Periarteritis cases do, however, occasionally survive the acute stage to die considerably later of its consequences or of intercurrent disease. We have had one patient, proved to have periarteritis nodosa by biopsy at this hospital, who died at home nearly two years later. From Vienna one case has been reported where an autopsy was secured about four years after the acute stage of the disease. The vessels were characterized by healed miliary aneurysms —exactly what one would expect from the nature of the acute lesions. In several vessels from this patient, particularly in the liver and kidney, healed aneurysmal dilatations of small arteries are present, certainly suggestive of the lesions that have been described. The involvement of the brachial artery and vein and the lesions in the small intrahepatic portal radicles are not well explained by this diagnosis but I must leave that question open.

A Physician: How do you explain the paradox of chronic lesions in the vessels and acute parenchymal degeneration?

Dr. Mallory: Of course we may have missed acute lesions in the vessels, but, as I said, this seems to me unlikely. I would make the following series of assumptions. During the acute stage of his disease many vessels were narrowed and some were completely occluded. He must in general have developed an adequate collateral, however, for only in the heart did we find any evidence of old parenchymal degeneration. In the last few days of life his heart weakened, his blood pressure probably dropped and circulation in focal areas dropped below the critical level.

Dr. Jones: Was there any evidence of peritonitis? I ask because for about a week he had intense abdominal pain and tenderness and it seemed as if he had peritonitis.

Dr. Mallory: I should think that pain might possibly have come from the liver infarcts. It is at least possible.

Dr. Jones: He had on two occasions sharp pains in the left arm, if I remember correctly, and we wondered again if he had a nodule. Material was sent for biopsy, but the sections did not suggest this at all?

Dr. Mallory: No they did not.

The muscle showed very marked atrophy with a great deal of fibrosis. There are nearly occluded arteries between the muscle fibers. The peripheral nerves were negative and the spinal cord was negative.

A Physician: Have the skin lesions any relation to this disease at all?

Dr. Mallory: My guess is no. How would you feel about it, Dr. Oliver? At the time of autopsy the skin lesions had disappeared.

Dr. Oliver: I think secondary infection might have had something to do with it. A pus infection on top of the skin affection might lead to this condition.

Dr. Smith: What about this repeated lymphangitis and cellulitis of the arm? Was that irrespective of the underlying disease?

Dr. Mallory: I should imagine he had a skin infection and lymphangitis probably unconnected with the underlying disease.

A Physician: Were any of these peculiar changes found in the coronary arteries?

Dr. Mallory: There were changes in the smaller ones, especially in the left auricle beneath the thrombi, where patches of absorption of muscle cells were found.

A Physician: Did the heart's blood show no growth?

Dr. Mallory: We did innumerable blood cultures at various times and they were all negative.

CASE 22122

Presentation of Case

A sixty year old white Canadian housewife was admitted complaining of pain in the abdomen.

The patient had been perfectly well until two months before entry at which time she had an attack of "gall stone colic" from which she recovered completely in a few days. Two weeks before coming to the hospital she had another similar attack, during which she developed a persistent pain in the back between the shoulder blades. At this time a physician reported the palpation of an enlarged, tender gallbladder which emptied suddenly following pressure, with relief of her pain. About a week later she began

to have severe pain in the midabdomen, and a mass about the size of a small grapefruit was felt in this region. Enemata produced no relief. On the following day she was unable to move either leg. The reflexes in the right leg were absent and those in the left were sluggish. From a level midway between the xiphoid and umbilicus downward, pain, heat, and cold perception were absent. Thereafter there was no change in her condition although the abdominal pain was intermittent.

Physical examination showed a markedly obese elderly woman in no acute discomfort. The skin of the arms was dry and scaly and there was an early decubitus ulcer in the sacral region. The heart sounds were regular but rather distant. P_2 was greater than A_2. The blood pressure was 120/80. Râles were audible at both lung bases. There was marked tenderness over and to the right of the third, fourth, fifth and sixth dorsal vertebrae. The abdomen was protuberant and firm, and there was tenderness with deep pressure in the left lower quadrant. No evidence of ascites was elicited. There was pitting edema of both ankles. There was complete paralysis of the lower extremities with weak knee jerks. The right ankle jerk was present, but the left was absent. No Babinski was elicited. There was diminution of touch perception from the fifth dorsal spine down. Vibratory sense was absent in the ankles, as was position sense in the toes.

The temperature was 100°, the pulse 120. The respirations were 20.

Examination of the urine showed a specific gravity of 1.002 to 1.008 in several specimens. There was a large trace of albumin and the sediment contained large numbers of white blood cells and on one occasion was loaded with erythrocytes. Casual urine specimens were negative for Bence-Jones protein but a twenty-four hour specimen was positive. The blood showed a red cell count of 4,900,000, with a hemoglobin of 90 per cent. The white cell count was 17,500, 90 per cent polymorphonuclears, 4 lymphocytes, 4 eosinophils, and 2 unclassified cells. The nonprotein nitrogen of the blood was 130 milligrams. An intramuscular phenolsulphonephthalein test showed less than 5 per cent excretion in 90 minutes. The serum protein was 11.4 grams per cent. A lumbar puncture between the third and fourth lumbar vertebrae gave an initial pressure of 110 and a final pressure of 0 after 8 cubic centimeters of clear, faintly yellow fluid was obtained. There were no respiratory oscillations observed and jugular pressure produced no change in the fluid pressure level. Examination of the spinal fluid showed 4 lymphocytes. The total protein was 560 milligrams per cent with a clot. Tests for globulin were positive. The sugar was 109 milligrams per cent and the Wassermann test was negative.

X-ray examination of the chest showed the heart to be enlarged downward and to the left. The aorta showed a marked degree of tortuosity. The lungs were clear. The skull exhibited multiple punched-out areas without any thinning of the cortex. The sixth dorsal vertebra was collapsed and the seventh was also said to be involved. Surrounding the fifth to the seventh dorsal vertebrae was a soft tissue mass which exhibited no calcification. The ribs were normal but the remainder of the skeleton showed slight decalcification.

Shortly after admission the patient developed a generalized blotchy, macular, dull red eruption, most intense over the abdomen. This persisted for about a week, at which time a vesicular-like eruption occurred about the lips. On several occasions crystals appeared upon the patient's forehead and face. About two weeks after entry the nonprotein nitrogen had gradually diminished to 58 milligrams and the patient had some return of sensation in her extremities. X-ray therapy was instituted over her kidneys, lips, and back. During the third week the patient gradually became drowsy, markedly nauseated, and her nonprotein nitrogen rose to 117 milligrams per cent. Thereafter she became stuporous and developed twitching of her hands. Her decubitus ulcers spread and concomitantly her temperature, which had fluctuated between 99° and 101°, rose to 104°, and she died on the thirty-third hospital day.

Differential Diagnosis

Dr. Wyman Richardson: Time is getting short and I will try to make this discussion brief. It is much easier to arrive at a diagnosis having gone over the entire course of this patient's illness. The difficulties confronting the physician earlier in the course of the disease, however, can easily be appreciated. If we consider the essential and important features, only one diagnosis appears to fit the facts. These features are as follows: First, a tumor involving the dorsal spine and also apparently involving the skull; secondly, a rather rapid failure of renal function; thirdly, the presence of Bence-Jones protein in the urine; fourthly, a serum protein of 11.4 grams per cent. Myeloma is the only disease which satisfactorily explains these findings. It is true that certain cases of widespread bone metastases from carcinoma have been reported in which there was Bence-Jones protein in the urine, but I am doubtful whether any such case showed a serum protein of 11.4 grams per cent. It is a well-known fact that patients with myeloma frequently die in uremia. Apparently the cause for this is a precipitation of the abnormal protein in the renal tubules with consequent failure of renal function.

If we try to explain all the symptoms on this basis there are certain ones which leave us rather puzzled. The story of the palpation of an en-

larged gallbladder with sudden emptying following pressure leaves me feeling very skeptical. I do not explain this. I believe, however, that the pain in the back between the shoulder blades, in view of the later symptoms, was due to destruction by tumor of the dorsal vertebra. The sudden paralysis and the sacral ulcer were surely due to invasion of the spinal cord by tumor. The spinal fluid findings are characteristic of this.

Evidently then, the sixth dorsal vertebra has been destroyed by tumor involvement, with encroachment upon the spinal cord. There does not appear to be by x-ray very widespread skeletal involvement, and the fact that there is no anemia is consistent with this idea. One wonders whether a critical eye could have detected plasma cells in the blood smear. I find it much easier to locate these cells after the diagnosis has been established by other means. It would have been interesting to have had some blood calcium determinations, as there is frequently a disturbance in calcium metabolism. I am not certain as to the nature of the skin eruption but would tend to associate it with uremia. The crystals which appeared on the patient's forehead and face were probably urea crystals. I assume that the patient died of renal failure and see no reason to suspect any other cause for her death.

I see I have not explained the presence of an abdominal mass. Nothing is said about this on examinations later on, and I am inclined to disregard it as probably due to some temporary stasis in the gastrointestinal tract.

We usually speak of myeloma as being multiple, but I am sure there have been cases of fairly localized tumors in this disease. We certainly are finding them much more frequently than we did a few years ago, undoubtedly because we are looking for them more carefully.

My diagnosis is, then, myeloma with secondary renal failure.

Dr. Alfred Kranes: I may be able to answer some of Dr. Richardson's questions. The patient was naturally admitted to the Neurological Service because of the paraplegia, and when the renal insufficiency was discovered I was asked to see her. The combination of renal insufficiency with normal blood pressure, skeletal pain, and cord block immediately suggested multiple myeloma, and I therefore looked for Bence-Jones proteinuria on a specimen voided at that time but was unable to find any. The next day, using a twenty-four hour specimen, we were able to demonstrate a moderate amount. This was an additional illustration of what we have seen in other cases of myeloma, namely, inability to demonstrate Bence-Jones proteinuria in single urine specimens but finding it in twenty-four hour collections. The morning that we were unable to find any Bence-Jones protein in the urine I looked over a smear for plasma cells and was able to demonstrate several, although as Dr. Richardson suggests one felt more certain of their being plasma cells when the Bence-Jones protein was discovered and the serum protein report was returned, and when finally the skull plate was seen we were positive about the plasma cells.

Calcium and phosphorus determinations were done and they were essentially those found in any case of renal insufficiency, the calcium being 9.98 and the phosphorus 6.25. A phosphatase showed 3.17 Bodansky units.

The abdominal mass described in the history we were unable to confirm.

Clinical Diagnoses

Multiple myeloma.
Uremia.

Dr. Wyman Richardson's Diagnoses

Multiple myeloma.
Myeloma kidney.

Anatomic Diagnoses

Multiple myeloma with destruction of the sixth dorsal vertebra and with compression of the spinal cord.
Hydronephrosis.
Myeloma kidneys.
Decubitus.
Perisplenitis, chronic.

Pathologic Discussion

Dr. Tracy B. Mallory: As Dr. Richardson pointed out, the diagnosis in this case once all the facts were known admitted of no possible doubt. The crux of the matter always rests in thinking of myeloma before the Bence-Jones protein in the urine and the hyperproteinemia have been discovered. Dr. Kranes deserves the credit for that in this case.

I take exception to only one of Dr. Richardson's predictions. The spinal cord in these cases, though often showing evidence of injury, is rarely invaded by the tumor. Occasionally an epidural tumor mass may press upon it, but more often the injury is from pressure secondary to destruction of the vertebrae and angulation of the spinal column. That was the case with this patient, who showed complete destruction of the sixth dorsal vertebra with marked angulation at that point. We were limited in our autopsy to an incision in the back, but after removal of a portion of the spinal column it was possible to explore the abdominal cavity from behind. There was no tumor and no abnormality of the gallbladder that could be discovered by palpation. The kidneys were removed and showed the characteristic changes found in cases of myeloma. The tubules were

universally dilated and a considerable proportion of the collecting tubules and Henle's groups contained the dense hyaline casts which are characteristically found. One point which often serves to differentiate these casts and those found in ordinary types of nephritis is that they appear to act like mildly irritant foreign bodies provoking a cellular reaction in which monocytes predominate and foreign body giant cells are occasionally seen.

This laboratory has always had a particular interest in multiple myeloma because the first adequate description of the histology of the tumors was published by Dr. Wright from a case which died in this hospital in 1898. The earliest report of the disease was probably that of Bence-Jones in 1848, but a clear picture of the gross pathology was first published in 1873 by J. von Rustizky, who gave it the name of multiple myeloma. To Dr. Wright belongs the credit for recognizing the characteristic cell as a plasma cell. The introduction of x-rays began to make the tumor readily recognizable when the cases were of the classical type with multiple small tumor nodules throughout the flat bones. In recent years we have learned that there are many clinical types. The disease can affect a single bone or can produce a diffuse leukemic involvement of all the hematopoietic marrow with absolutely no x-ray changes. It can, moreover, appear in an extra-osseous form, and primary plasmocytomas of the nasal pharynx are undoubtedly another manifestation of the same process.

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MORE ABOUT POLIO VACCINES

IN our issue of October third, 1935, we cautioned against the too hasty trial of vaccines advocated for the prevention of anterior poliomyelitis. It was our conviction that vaccines composed of killed virus could have little or no immunizing value. At that time, while we had very grave doubts as to the harmlessness of vaccines made from "attenuated" virus, we did not express our fears because we lacked proof of the effect of such living vaccines upon susceptible children. We privately believed that the tests to which these vaccines had been subjected fell far short of proving that they could be safely used for the immunization of human beings. To test these agents on urban adults or even on children of eight years or more could furnish no criterion for their action in children in the more susceptible age groups.

We knew that the use of small amounts of formalin, of sodium ricinoleate or other antiseptics can attentuate viruses only by diluting them. If the concentration of the added germicide is sufficient to kill the virus, the vaccine is impotent; if lower concentrations are employed some of the virus will remain alive.

The first effect was the one sought by Brodie; the latter by Kolmer, who believed that living virus was necessary for the production of active immunity.

A careful reading of the publications of these two authors gives the impression that Brodie was confident that in his vaccine the virus was dead, while Kolmer believed that, although the virus in his preparation was living, by his treatment it had been robbed of its infectious power. The virus in the Brodie vaccine might or might not be dead—the virus in the Kolmer vaccine was living and capable of producing infection in monkeys. The fact that the injection of this viable virus into Kolmer, his two sons and his colleague was followed by no untoward results is of little significance in so far as the safety of the vaccine is concerned. The preliminary tests made by Brodie on his vaccine were, to our minds, of even less significance, since his subjects were all urban adults, who presumably were immune to anterior poliomyelitis.

So great was the demand for protection against this disease that ten thousand or more children and adults were treated with these two vaccines. Since our editorial appeared it has become increasingly evident that such vaccines may not be the innocuous agents that they have been assumed to be.

In a communication appearing in late December, written by one of the able and conservative officers of the United States Public Health Service, there were reported twelve cases of undoubted acute anterior poliomyelitis appearing in children treated with two poliomyelitis vaccines. These cases developed in a community where the disease was not prevalent; at the time of the occurrence of these cases the period elapsing between the first injection of the vaccine and the onset of symptoms would cover the incubation time of poliomyelitis infection; in every case in which the sequence was known, the level of the spinal cord first affected corresponded to the extremity in which the injection was made; the incidence of infection was greater among the vaccinated children than among unvaccinated children of the same ages and similar circumstances; and, of these twelve vaccinated children, six died—a fatality rate of fifty per cent, a rate far above that of the cases of poliomyelitis occurring last autumn throughout the country.

Furthermore, doubt has arisen as to the complete harmlessness of the Brodie vaccine.

As a result of these revelations, Park has ceased to give out the Brodie agent for human immunization and the supply of the Kolmer vaccine has been limited. Geiger, Health Commissioner of San Francisco, has recently for-

bidden the use of poliomyelitis vaccines in the city and county of San Francisco.

In our previous editorial we argued for extreme conservatism in accepting any agent designed for the prevention or treatment of this disease, and we emphasized the necessity for subjecting any such biological agents to rigid controls. We repeat this plea and urge physicians to be positive of the harmlessness of any such products before they use them in their practice or before giving them approval.

Polio vaccines must wait. They must be studied far more exhaustively than they have been before again being used on human beings. Medical men and public health officers also must wait, and they will be wise if they delay their adoption of these new agents until they are approved by our Federal Public Health Service.

REFERENCES

1. Kolmer, J. A.: Susceptibility and immunity in relation to vaccination in acute anterior poliomyelitis. J. A. M. A. **105**: 1956 (Dec. 14) 1935.
2. Leake, J. P.: Poliomyelitis following vaccination against this disease. J. A. M. A. **105**: 2152 (Dec. 28) 1935.

LESS FOOD WITH MORE MEALS

More frequent and more moderate meals for the human family were suggested by Dr. Howard W. Haggard, head of the Department of Applied Physiology at Yale University, addressing delegates to the conference of the Personnel Research Foundation in New York last January. This conclusion was based on a study of medical and mental factors affecting workers in business and industry, where efficiency was found to be increased when additional food, in limited quantities, was taken between breakfast and lunch and again between lunch and dinner.

The practice also proved of value in building up the health of workers who were found to be suffering from a deficiency in diet.

Even prior to Dr. Haggard's work it has unquestionably been found of benefit by many individuals to prevent the blood sugar tide from ebbing too far; apparently the omnivorous human animal fares best when a medium is struck between the habits of the carnivorous animal who eats infrequently but to repletion, and the herbivorous type which grazes practically constantly.

A change in the habits of a nation, however, is not made without some drastic readjustments, and if Dr. Haggard's suggestions are accepted in too literal a fashion there may be some repercussion on the ever-present servant problem; there will also continue to be the world's millions who are forced to ignore the blood sugar tide and draw their belts still tighter when that empty feeling overtakes them.

Perhaps, also, the true reason has been found why England, with four square meals a day, has maintained for these centuries the supremacy of the seas. Possibly Waterloo was won, not on the cricket fields of Eton but on the roast beef of merry England.

HOUSE BILL 34

At this writing House 34 is still before the Massachusetts Senate and seems to be in line for postponement of final action because of an amendment which will probably carry it back to the House for concurrent approval unless some other action is taken. It has been the cause of stormy and acrimonious debates.

The opponents have made a significant demonstration of the purpose to block the effort to endow the State Board of Registration in Medicine with more authority to deal with the educational experience of applicants for registration.

They seem to be unappreciative of its advantages and their arguments are apparently inspired by prejudice rather than reason. It was apparent, at a recent hearing, that an aggressive minority was unable to understand the plain English construction of the bill.

The arguments submitted in opposition are singularly lacking in logic and based almost entirely on the wish to keep the door to medical practice open to the "poor boy", completely ignoring the right of the people to have the best possible medical service. The fact that the boy without financial resources has generally been given adequate assistance to obtain an education, provided that he is otherwise well equipped, has been left out of the picture. Hence the attack has degenerated to the position of misstatements and personal abuse with all the arts of the political agitator. The Board of Registration in Medicine, the author of the bill, and the Officers and Fellows of the Massachusetts Medical Society who have worked for its passage have been criticized on the floor of the Senate Chamber in language devoid of the approved amenities of debate, quite in accord with the practice sometimes reported in legal controversies.

When the bill was reported out of the House and forwarded to the Senate, the following amendment was added:

> "Section 3. For purposes of examination and registration, osteopathic schools rated as A schools by the American Osteopathic Association shall have the same standing before the board as A schools so rated by the American Medical Association."

In the Senate several proposed amendments designed to weaken the bill have been rejected, but there is probability of the following being added to the present draft:

> Add at the end of section one the following:—"An applicant aggrieved by

> the refusal of the board to approve a medical school under this section shall be entitled to have the reasonableness of such refusal reviewed by a justice of the superior court, whose decision shall be final."

Another amendment is pending which, if enacted, will give to the Secretary of the Board of Registration, The State Commissioner of Public Health and The State Commissioner of Education authority to determine which medical schools may be approved.

Further delay has been sought by the request to the Supreme Court for a decision as to the constitutionality of the bill. The general impression is that this bill has provoked the most animated debate of the 1936 session.

While there is a strong sentiment in favor of enactment of this bill the opposition is resourceful and will employ every legislative expedient to discourage its supporters who are still confident of success. Assuming that the arguments for special consideration of the plight of the "poor boy" are based on the opportunities existing in the substandard medical schools, significant facts are presented in the preliminary report of the Registration Board examination recently held which appears on page 599 of this issue of the *Journal*, where it is shown that a majority of the applicants for registration are repeaters from medical schools which are not approved by the Council on Medical Education and Hospitals. The figures warrant careful consideration and should have influence in determining the attitude of the members of the Legislature.

Much credit is due to Senator Miles of Brockton who has carried the major burden of the proponents.

If it were possible for the women of the State to express their sentiments, there would be little doubt of the outcome. We believe that they, very generally, want for themselves and the children of the Commonwealth the blessings of scientific medicine.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY

THE Annual Meeting of the Massachusetts Medical Society has always appealed to the membership at large because the Committee of Arrangements and the State Officers have worked unceasingly to provide a program well-balanced, and interesting to all physicians.

In furtherance of that plan, the Section devoted to Obstetrics and Gynecology will, this year, present three papers which it is felt will have a distinct appeal to the man in general practice as well as to the specialist.

One of the influential physicians in the field of obstetrics, Dr. Edward A. Schumann of Philadelphia, will read a paper on "Ante-Partum Hemorrhage." This is a very timely subject because statistics in our own State show that it is one of the most common causes of maternal mortality.

Another paper will be read by Dr. F. L. Good on "Menorrhagia and Metrorrhagia of Benign Origin in Women Under Forty-Five Years, With a Plea for More Conservative Treatment." This is always an important subject, for there are divergent views as to the treatment applicable to this class of patients.

A third essay by Dr. George M. Shipton will deal with "Hospital Puerperal Sepsis." This paper will probably promote as much discussion as time will permit, for it will cover an actual series of cases and will be handled fearlessly.

The Officers of the Section earnestly urge every practitioner to plan now to attend this Section Meeting and enter into the discussion of these papers, which have been designed to bring out problems that are met in everyday practice.

The Annual Meeting is primarily for medical problems, but it will also introduce social features. Make it a three-day vacation. Ample recreation has been provided for the ladies while the doctors improve their medical knowledge.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

BENEDICT, EDWARD B. A.B., M.D. Harvard University Medical School 1923. Assistant in Surgery, Harvard University Medical School and Massachusetts General Hospital. Clinical Assistant in Bronchoscopy and Esophagoscopy, Massachusetts Eye and Ear Infirmary. His subject is Gastroscopic Observations in Neoplasm. Page 563. Address: Massachusetts General Hospital, Boston, Mass.

WALKER, IRVING J. A.B., M.D. Harvard University Medical School 1907. F.A.C.S. Surgeon-in-Chief, Harvard Surgical Teaching Service, Boston City Hospital. Clinical Professor of Surgery, Harvard University Medical School. Address: 520 Commonwealth Avenue, Boston, Mass. Associated with him are

WEISS, SOMA. M.D. Cornell University Medical College 1923. Associate Professor of Medicine, Harvard University Medical School. Director of the Second and Fourth Medical Services (Harvard). Associate Physician of the Thorndike Memorial Laboratory, Boston City Hospital. Address: Boston City Hospital, Boston, Mass. And

NYE, ROBERT N. A.B., M.D. Harvard Uni-

versity Medical School 1918. Assistant Pathologist, Boston City Hospital. Instructor in Bacteriology and Immunology, Harvard University Medical School. Address: Boston City Hospital, Boston, Mass. Their subject is Salmonella Suipestifer Infection with Surgical Complications. Page 567.

HARE, HUGH F. B.S., M.D. Harvard University Medical School 1928. Assistant Roentgenologist, Peter Bent Brigham Hospital. Consultant, Middlesex County Sanatorium, Waltham. Radiologist, Lahey Clinic. Address: 605 Commonwealth Avenue, Boston, Mass. Associated with him are

POPPEN, JAMES L. A.B., M.D. Rush Medical College, Chicago, Illinois 1930. Associate in Neurosurgery, Lahey Clinic. Member of Staff, New England Deaconess and New England Baptist Hospitals. Address: 605 Commonwealth Avenue, Boston, Mass. And

HOOVER, WALTER B. M.D. Washington University School of Medicine 1922. Otolaryngologist, New England Baptist Hospital and New England Deaconess Hospital. In charge of Ear, Nose and Throat Department, Lahey Clinic. Address: 605 Commonwealth Avenue, Boston, Mass. Their subject is Cancer of the Mouth. Care of the Patient Utilizing Prolonged Anesthesia Obtained by Alcohol Injection of Branches of the Fifth Nerve. Page 572.

NISSEN, H. ARCHIBALD. A.B., M.D. Harvard University Medical School 1916. Formerly, Assistant Physician, Robert B. Brigham Hospital. Member of the Staff and Visiting Physician, New England Deaconess Hospital. Assistant Physician, Palmer Memorial Hospital. Former Instructor in Medicine, Harvard University Medical School. Member of American Association for the Control and Study of Rheumatic Disease. Address: 205 Beacon Street, Boston, Mass. Associated with him is

SPENCER, K. A. Formerly, Survey Executive, Robert B. Brigham Hospital. Now, Medical Research Statistician, assisting Dr. Nissen. Address: 232 Bay State Road, Boston. Their subject is The Psychogenic Problem (Endocrinal and Metabolic) In Chronic Arthritis. Page 576.

PENHALLOW, DUNLAP P. S.B., M.D. Harvard University Medical School 1906. F.A.C.S. Surgical Staff, Providence Hospital. Professor, Clinical Orthopedics, Georgetown University School of Medicine. His subject is An Unusual Fracture of the Lower End of the Radius (Atypical Colles's). Page 581. Address: 1830 Jefferson Place, N. W., Washington, D. C.

GOODALE, RAYMOND H. B.S., M.D. Harvard University Medical School 1924. Pathologist, City Hospital, Worcester. Visiting Pathologist, Belmont Hospital and Fairlawn Hospital, Worcester, and Harrington Memorial Hospital, Southbridge. Assistant Professor of Experimental Pathology, Boston University School of Medicine. His subject is A Proposal for a Clinico-Pathological Conference. Page 582. Address: City Hospital, Worcester, Mass.

PEARSON, M. W. M.D. Harvard University Medical School 1891. Chief of Staff, Mary Lane Hospital, Ware. Address: Ware, Mass. Associated with him is

ANGIER, HARLAN W. M.D. Tufts College Medical School 1915. F.A.C.S. Visiting Surgeon, Mary Lane Hospital, Ware. Consulting Surgeon, Wing Memorial Hospital, Palmer. Address: 45 Main Street, Ware, Mass. Their subject is Pregnancy in Bicornate Uterus. Page 583.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY*

C. J. KICKHAM, M.D., *Chairman*
524 Commonwealth Ave., Boston, Mass.

R. S. TITUS, M.D., *Secretary*
472 Commonwealth Ave., Boston, Mass.

CARCINOMA OF THE CERVIX AND PREGNANCY

Carcinoma of the cervix and pregnancy is an uncommon combination and occurs in the ratio of one to 2,000. The tumor may arise before pregnancy takes place or may become apparent only after pregnancy is well established.

The symptoms, as in all cancers of the cervix, may be slight or absent until the disease is well advanced. Early recognition of the growth must be made by examination before symptoms commence. Once the growth has reached symptom-giving proportions there should occur spotting, discharge, and mild hemorrhage. Pain is a late symptom and does not occur until broad ligament invasion has taken place.

On inspection the pregnant cervix, if the seat of a congenital erosion or an exposure of the endocervix due to an old laceration, is vascular and edematous and suggests hyperplasia of the epithelial structures. It is usual for cervical cancer to be hard and friable but this tumor complicated by pregnancy may be soft and is often blended into the structure of the edematous cervix. In advanced cases with a cauliflower or ulcerating lesion, the diagnosis is usually obvious.

When the disease is suspected the diagnosis should be confirmed by microscopic examination of a piece of tissue. The microscopic diagnosis

*A series of short selected articles by members of the Section is being published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the Section.

of cervical cancer uncomplicated by pregnancy is easy but when complicated by pregnancy it may be unusually difficult. Proliferation of epithelium with down growth into the underlying connective tissue is not rare. Mitotic figures occur. The cells, however, are usually less undifferentiated and anaplastic and upon this fact the diagnosis can be accomplished.

The treatment of carcinoma of the cervix in pregnancy is not always clear but general principles can be laid down. Infection is a great hazard both in the radium and surgical treatment and careful vaginal preparation must always be carried out. In early cancer and early pregnancy, radium or total hysterectomy is the method of choice. In late cancer and early pregnancy, radium should be used. The pregnancy should be interrupted by gentle instrumentation at the time of application of radium. Miscarriage usually follows without complication.

In early cancer and a pregnancy of from three to six months, amputation of the cervix with evacuation of the uterus followed by radium treatment or a total hysterectomy should be carried out. In advanced cancer, radium followed after at least six weeks by cesarean section, depending upon the state of the fetus, is the proper procedure.

In early cancer and a pregnancy advanced to six months or beyond, treatment of the cancer with radium followed by cesarean section at the time of election is proper if a child is desired, and this method of treatment is usually satisfactory. If the child is not to be considered, a total hysterectomy may be done. If the cancer is advanced, cesarean section should be performed to save the child. This should be followed by radium treatment. The delivery of a large fetus through a radium-treated cervix is not a safe procedure and should be avoided.

The prognosis is often better than in uncomplicated cancer of the cervix,—for the tumor, because of frequent antepartum examinations, may be discovered early and either radium treatment or hysterectomy has a better than usual chance of success.

The problems of diagnosis and treatment in cases of pregnancy complicated by carcinoma of the cervix are great for the radiologist, obstetrician, and pathologist and each case is deserving of special individual consideration. No absolute rules can be laid down, but early biopsy in suspicious cases should be carried out and, on the whole, treatment with radium with due regard to the age of pregnancy is best.

AIDS TO THE COMMITTEE OF ARRANGEMENTS

BRISTOL SOUTH DISTRICT

Dr. Curtis Tripp, New Bedford, Mass.
Dr. Emery C. Kellogg, Swansea, Mass.
Dr. John C. Corrigan, Fall River, Mass.

A PRIZE FOR AN APPROVED ESSAY

The attention of interns in Massachusetts hospitals is called to the fact that a prize of $50.00 has been offered by the Massachusetts Medical Society for the best written and most comprehensive case report submitted by one of their number holding a rotating internship in any Massachusetts hospital which is approved by the American Medical Association for intern training during 1935-1936.

This report is to be typewritten, and when completed is to be sealed, unsigned, in a plain envelope, which in turn is to be placed together with a separate slip bearing the name and address of the contestant, in a larger envelope, and sent to:

The Massachusetts Medical Society,
Committee on Medical Education and Medical Diplomas,
8 Fenway, Boston, Mass.

The contest this year closes May 1, 1936. Reports may be submitted at any time prior to that date.

THIRD ANNUAL POSTGRADUATE MEDICAL EXTENSION COURSE

Postgraduate Extension Courses, scheduled this spring in the various Districts, will begin as follows:

Berkshire

Thursday, March 26, at 4:30 P.M., at the House of Mercy Hospital, Pittsfield. Subject: Psychobiology in General Medicine. Instructor: Kenneth J. Tillotson. Melvin H. Walker, Jr., Chairman.

Bristol North

Wednesday, April 1, at 7:30 P.M., at the Morton Hospital, Taunton. Subject: Acute and Chronic Nephritis. Instructor: Earle M. Chapman. Arthur R. Crandell, Chairman.

Bristol South (New Bedford Section)

Friday, March 27, at 4:00 P.M., at St. Luke's Hospital, New Bedford. Subject: Acute and Chronic Nephritis. Instructor: James P. O'Hare. Harold E. Perry, Chairman.

Middlesex East*

Wednesday, April 22, at 4:00 P.M., at the Melrose Hospital, Melrose. Subject: Acute Nephritis — Etiology, Diagnosis and Treatment. Nephrosis and Its Treatment. Instructor: Lyman H. Hoyt. Joseph H. Fay, Chairman.

Middlesex North

Friday, April 17, at 7:00 P.M., at the Lowell General Hospital, Lowell. Subject: Acute and Chronic Nephritis. Instructor: James P. O'Hare. Leonard C. Dursthoff, Chairman.

*Inasmuch as five sessions were given in this District during the fall of 1935, there will be but five sessions this spring.

Norfolk†

Friday, March 27, at 8:30 P.M., at the Norwood Hospital, Norwood. Subject: Immunology—Latest Developments in Immunization. Smallpox, Typhoid, Measles, Scarlet Fever, Diphtheria, Whooping Cough, and Infantile Paralysis. Instructor: Gaylord W. Anderson. Hugo B. C. Riemer, Chairman.

Worcester (Milford Section)

Wednesday, March 25, at 8:30 P.M., at the Milford Hospital, Milford. Subject: Gastroenterology. Instructor: E. Stanley Emery. Joseph I. Ashkins, Sub-Chairman.

†The course previously given at the Faulkner Hospital will be combined with the group at the Norwood Hospital.

MISCELLANY

MASSACHUSETTS BOARD OF REGISTRATION IN MEDICINE

Preliminary Report on Examination Held March 10, 11, 12, 1936

One hundred and seventy-seven candidates presented themselves for examination on the first day.

One hundred and seventy-four candidates presented themselves on the second day. Of the three candidates who withdrew on the first day, all were repeaters (at least twice), one from an "approved school", two from "nonapproved" schools.

Fifty-six candidates took the examination for the first time; 44 from "approved schools"; 12 from "nonapproved" schools.

One hundred and eighteen candidates took the examination having failed at a previous examination; of these 99 had failed at least twice, and 19 had failed at least three times.

Of the 99 repeaters, 15 were from "approved" schools; 84 were from "nonapproved" schools.

Of the 19 candidates, who had failed three or more times, two were from "approved" schools, one foreign, one in United States and 17 were from "nonapproved" schools.

CONNECTICUT ITEMS

Recent Deaths

HURLBUTT—Augustus Moen Hurlbutt, M.D., formerly a prominent surgeon of Stamford, Connecticut, died at his home, March 2, 1936, aged eighty-one years.

Born in Stamford, a graduate of Yale and the College of Physicians and Surgeons of New York, Dr. Hurlbutt had practiced in his native town for over fifty years.

QUINTARD—Edward Quintard, M.D., of New York City, with a summer home in Norfolk, Connecticut, died at Chattanooga, Tennessee, February 12, 1936. He was planning to devote his time next summer to writing a book to be called "Knollybrook Essays."

Dr. Quintard was an author of many volumes of verse and essays as well as having been active as a medical teacher and practitioner.

MOUNTAIN—John H. Mountain, M.D., City Health Officer of Middletown, Connecticut, died at St. Raphael's Hospital, New Haven, Connecticut, March 6, 1936. He was a member of the State Medical Society and the American Medical Association.

Miss Abbott's Election

Miss Lucy B. Abbott of the William Backus Hospital, Norwich, Connecticut, was elected President of the New England Hospital Association at the recent meeting of this association at Boston, Massachusetts.

29,000,000 Visits to Homes

Dr. Howard W. Haggard, Associate Professor of Applied Physiology at Yale University, said the 20,000 nurses in the organization's ranks in 1935 were "probably a tenth as many as could be used to greatest advantage." The present staff in a population of 120,000,000 provides only one nurse for every 6,000 inhabitants, he pointed out, "and yet last year that little band made 29,000,000 visits to American homes, visits of mercy and education."—*New York Times*, March 11.

TUBERCULOSIS ABSTRACTS

Issued Monthly by the National Tuberculosis Association

April, 1936

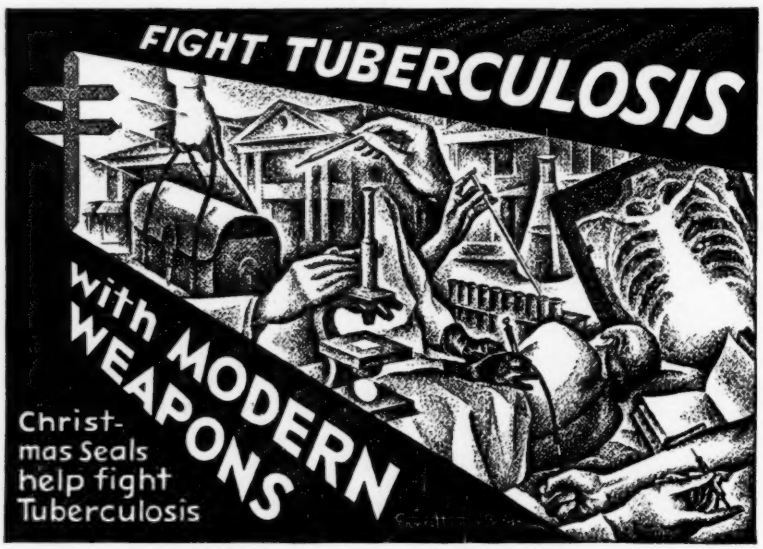
Those who see the steady stream of patients entering the tuberculosis sanatorium deplore the all too evident delay in making the diagnosis. About five out of each six patients in our sanatoria throughout the country are classified on admission as moderately advanced and far advanced cases of tuberculosis. One reason for delay in diagnosis is undoubtedly to be found in the lethargy of the people, coupled with the common human failing of not wishing to face unpleasant facts. Another reason is that even though the warning signals of tuberculosis have been given widespread publicity in the past, new generations are constantly appearing on the scene and older ones forget so easily. What are tuberculosis associations doing to meet this situation?

URGING EARLY DIAGNOSIS

The founders of the tuberculosis movement realized that only through broad education of the public could any progress against tuberculosis be made. The new discoveries of Koch, Naegeli, Pirquet and others, the promising results of Trudeau's method of treatment, the pioneering activities of Biggs, inspired hope that the disease which had resisted medical science so long could be curbed. Yet this could be accomplished only with the understanding support of the people. They must know that tuberculo-

sis is curable and preventable, that it is not a stigma, and that facilities for diagnosis and treatment must be liberally provided. Wisely the founders chose as the motive power of the new movement, public education. In the early days the exhibit and the lecture were the chief means of arousing public sentiment. Later the press, printed matter and motion pictures were added. Today practically every avenue of reaching the attention of the masses is used.

Each year tuberculosis associations select a certain theme which all associations are urged to emphasize during that year. Printed matter and publicity aids are produced in advance. To make a definite impact the "release date" is set for April 1.



Type of poster design used in educational campaign.

Early diagnosis was the subject of the first of these campaigns hence it was called "Early Diagnosis Campaign," a label which has persisted even though subsequent themes were on other aspects of tuberculosis control.

This year the slogan is "Fight Tuberculosis with Modern Weapons." The two objectives aimed for are (a) to remind people of the early symptoms of tuberculosis and the importance of consulting the doctor on their appearance, (b) to arouse interest in the routine search for early tuberculosis before there are symptoms and physical signs.

To achieve the former, booklets, articles and outlines for talks have been prepared calling attention to the four most common symptoms of early tuberculosis (as determined by surveys of large numbers of sanatorium patients), namely, fatigue, loss of weight, cough that hangs on and indigestion. Blood spitting, pleuritic pain and other symptoms are also mentioned. It is carefully explained that none of these symptoms is pathognomonic, but that any of them should be considered as a danger signal to be investigated by the physician. An effort is made to create appreciation for the x-ray. In all the educational material, care is exercised not to cause undue alarm.

The second objective sought is to encourage routine search for symptomless tuberculosis among groups of young people such as high school and college students. What is the justification for advocating this new departure?

Tuberculosis sanatorium statistics indicate that the ratio of "early cases" admitted has not increased appreciably during the past ten years. This in spite of years of earnest effort to urge people to obtain medical advice on the appearance of the early symptoms enumerated above. Many conscientious doctors constantly on the alert for tuberculosis have despaired of increasing their batting average of discovering the disease in its incipiency. The reason for that failure cannot be blamed entirely on the apathy of patients, nor on the lack of vigilance of doctors. It is to be accounted for in part by the fact that the transition from "early" or "silent" tuberculosis to the moderately advanced stage is usually a relatively swift one and only by the barest chance is the minimal case detected. So long as we are obliged to wait until symptoms betraying pulmonary damage drive the patient to our offices, we shall probably continue to despair.

Wrestling with this deplorable state of affairs, efforts have been made to devise some way of detecting tuberculosis in its silent stage among apparently healthy people. Chadwick, Rathbun, Myers and others pioneered in introducing the scheme of examining routinely, with tuberculin and the x-ray, students in colleges and high schools. This procedure, modified in various ways, has "caught on" throughout the country. The routine examination of all students brings to light early cases that might otherwise be undetected and progress to disabling disease. Lees, who examined last year all students of the University of Pennsylvania by the tuberculin-

x-ray method, found 17 cases of adult type pulmonary tuberculosis of whom all were symptomless and only one was dismissed from the school. Contrast this with the usual method of "passive" case finding, i.e., waiting for persons to apply to the doctor for the relief of symptoms. Lees reports that during the course of the same year, 15 cases of tuberculosis had been discovered among students who came to the doctor because of one or another symptom. Twelve of the 15 were advanced cases and were obliged to leave school.

In high schools the story is substantially the same except that fewer cases of adult type tuberculosis are found. However, follow-up work of adolescent children with significant childhood type lesions leads the investigators into many homes where there is an open case. This is important, for the real threat to the youngster is probably not the calcified remains of a primary complex but daily contact with a source of infection. No wonder proponents of the routine tuberculin-x-ray plan emphasize the value of locating such sources of infection. In grade schools the routine method has not been found so productive but where funds and facilities are available, it is certainly an excellent addition to our school health program.

It is with the hope that the public will accept these newer ideas for the protection of young people that demonstrations are carried on in several important colleges and schools. It is hoped that ultimately parents will depend upon the family doctor to examine their children as a matter of course with tuberculin and the x-ray when indicated. In this educational campaign, tuberculosis associations look to the physician for guidance and counsel.

ROENTGENOGRAPHIC VISUALIZATION OF CEREBRAL VESSELS*

The technique of roentgenographic visualization of the cerebral vessels by injection of radio-opaque substances into the carotid artery has been only sporadically adopted since its introduction by Moniz, Pinto, and Lima in 1931.

The method as described by the above authors consists in exposing and ligating the common or internal carotid artery, injecting colloidal thorium dioxide (thorotrast) and taking x-rays of the skull near the completion of the injection. Since this method constitutes a major surgical technique, many surgeons have hesitated utilizing the procedure. Because of this objection Loman and Myerson have developed a more direct method of cerebral vasography which may be learned after a short period of practice.

Briefly, this method is as follows: With the patient lying on his back and the side of the neck sterilized and novocainized, a needle attached to a syringe is inserted through the skin into the common carotid artery at the level of the cricoid cartilage. In order to make certain that the needle is well within the lumen of the vessel, the needle is connected by means of a stopcock to tubing and an aneuroid manometer. If the puncture is successful, the manometer needle records wide oscillations, and furthermore, compression of the carotid artery below the puncture site causes a quick fall in pressure followed by a rapid return to the original pressure with free oscillations when the compression is released.

If these conditions obtain, the procedure is continued as follows: An assistant either slows the arterial flow to the brain by compressing the carotid artery below the site of puncture, or better still slows the cerebral venous circulation by compressing both jugular veins. While either type of compression is being continued, the operator injects as rapidly as possible 10 cc. of colloidal thorium dioxide. Rapidity of injection and adequate compression of the neck until all the x-ray plates are taken are requisites for successful visualization of the cerebral vessels. Lateral plates are taken, exposure being one-half second. The first roentgenogram taken near the completion of the injection gives a beautiful outline of the internal carotid artery and its branches. A second and third roentgenogram, taken at three-second intervals, give good pictures of the cerebral veins and sinuses.

Of thirty injections done by the writers, neither immediate nor late ill-effects have been observed. Not only may aneurysms of the internal carotid or its branches be directly visualized by this method, but many cerebral neoplasms may be indirectly located by the presence of dislocation of the cerebral arterial tree. It is probable also that other cerebral abnormalities may be determined by cerebral vasography.

*Abstract—Loman, Julius: Visualization of the cerebral vessels by direct intracarotid injection of thorium dioxide thorotrast. Am. J. Roentgenol. 35: 188 (Feb.) 1936.

CORRESPONDENCE

THE ANNUAL REGISTRATION OF PHYSICIANS

March 16, 1936.

Editor, *New England Journal of Medicine*,

The bill for Annual Registration of Physicians was referred to the Council as to the support of the Society before the Legislature.

After rather careful study, I commented on various parts of the bill which seemed dangerous to the future welfare and independence of the Medical Profession. In the report of the Council Meeting in last week's *Journal*, I read only an extract from an editorial in the *Journal* and this editorial favored the bill.

Some of the unfavorable features of the bill brought out in my remarks were, I believe, in some small part responsible for the overwhelming and almost unanimous vote by the Council *not* to support the bill.

For the information of the Medical Profession, I trust you will, this week, be able to publish the fol-

lowing remarks made by me at the Council Meeting.

(The bill is still before the Legislature.)

ANNUAL REGISTRATION OF PHYSICIANS

According to the Editorial of December 12, 1935, in The *New England Journal of Medicine*, the official organ of the Massachusetts Medical Society, "The real intent of the bill is slightly different from the obvious purpose which appears on superficial examination, . . . The real intent of the bill is to provide accurate and adequate information, easily accessible to all, as to which physicians the state now regards as qualified to practice medicine. Annual registration is only one of the elements necessary in fulfilling this intent."

If the bill becomes a law, what its purpose is will be determined by each changing board unless some individual physician takes the matter to court. Is it not therefore wise to see how the bill affects the physician?

"Every person registered by the board as a qualified physician, who is engaged in the practice of medicine within the Commonwealth, shall annually in December, etc."

The above are the only physicians specified for annual registration. No provision is made for registering already licensed physicians who have been in Europe for a year or two or who have been ill and out of practice or who have been in practice, temporarily or otherwise, in some other state or for those who wish to enter practice at some other date than December 31.

A physician registering must record "with the board his name, his registration number, his professional address, *and such other information as the board may require.*" This allows each board great latitude and if the tendency in the world toward bureaucracy and autocracy, regardless of party continues, before long physicians will be likely to find that boards at various times will require different kinds of information. "Such other information as the board may require" does not belong in the bill unless it is expected that the board will use considerable discretion in reregistering.

Furthermore applications for reregistering must be filed "on blanks furnished by the board at the request of the physician". These applications are to be remembered and filed at the busiest time of the year for physicians. If the physician is to furnish the funds, why should not the board at least be required to send out blanks?

The present laws against practicing medicine without a license are severe and it would seem, enforceable.

The need of annual lists of registered physicians seems small. Practically 5,000 of the 7,000 physicians in the state are members of the Massachusetts Medical Society and are annually published alphabetically and by cities and towns. Other organizations possibly list 1,000 more. The town and city clerks all have compulsory lists of all registered physicians in their communities. Every city and town directory has up-to-date lists of physicians and the telephone directories semiannually publish more or less complete lists.

To summarize, the present laws have plenty of teeth. The vast majority of the physicians are already listed in various ways. The proposed law makes one more nuisance tax. If a law is to be enacted for annual registration and if the physicians are to raise annually $15,000 for the use of the State, then the law should not be ambiguous, and it should be mandatory that the board register physicians already holding a Massachusetts license provided they furnish certain specific information. Disciplinary action regarding physicians is already apparently adequately provided for in existing law and no physician should feel any annual anxiety as to his registration renewal.

RICHARD DUTTON.

STATE MEDICINE AND HOSPITAL SERVICE

March 10, 1936.

Editor, *New England Journal of Medicine*,

"City Hospital Out-Patient Department Sets Record of Nearly 500,000 Patients." Such a headline stared at the reader a few days ago in *The Boston Herald*. From further reading of the two-column article, one concludes that instead of half a million patients it meant more likely half a million consultation visits, figuring an average of five visits to a patient. I have not at hand the corresponding figures of our other large hospitals, as the Massachusetts General, the Peter Bent Brigham, the Massachusetts Memorial, and the Beth Israel Hospitals. Assuming even that the total number of consultations in all these hospitals will only equal that of the City Hospital, it would mean a round million free consultations a year in Boston alone. Taking even the lowest average of a medical fee of one dollar per consultation, it would make a sum of one million dollars in fees, of which the medical profession was deprived as an income.

Far be it from me to begrudge the unfortunates who are forced to seek free medical service. I believe 95 per cent of them belong to those, for whom each dollar given as a fee would mean so much less food, fuel, and clothing for himself and his family. They are certainly entitled to be taken care of. But the question is, who should foot the bill? Why should the medical profession alone shoulder the whole burden? Would it not be more just to arrive at an equitable distribution of this burden in form of taxation perhaps, where the medical profession would be necessarily likewise represented? Owing to the millions of free consultations, hundreds of physicians in Boston are confronted with the heavy problem of making both ends meet, and many of them are forced to give up practice and look, though mostly in vain, for anything else to eke out a living.

In view of these figures and the present deplorable situation caused by the many years of depression, I question the wisdom of our officials in the American Medical Association, as well as in our

own State Society, in so bitterly opposing state or socialized medicine, which at least would guarantee to physicians a minimum fee for services rendered, and assure them a moderate pension when disabled or aged.

M. J. KONIKOW, M.D.

726 Washington Street,
Brookline, Mass.

DR. RHOADS' COMMENT ON "POLIO VACCINES"

The Hospital of The Rockefeller Institute
for Medical Research
66th Street and York Avenue, New York

February 3, 1936.

Editor, *New England Journal of Medicine*,

I am very much interested in the editorial in The *New England Journal of Medicine* for October 3, 1935. I quote from that editorial:

"If we remember their laboratory experiences correctly (Harvard Infantile Paralysis Commission) it would seem that the injection of sub-infective amounts of living virulent virus repeated many times failed to produce sufficient active immunity to protect a susceptible monkey against a subsequent inoculation with a fatal dose of virus."

This is contrary to the facts, since Aycock was able to immunize by sub-infective amounts and we were able to repeat this work.

C. P. RHOADS, M.D.

EDITORIAL COMMENT: We welcome Dr. Rhoads' comment on our editorial, "Polio Vaccines" and, in order to meet his very reasonable objection and, at the same time to be more explicit, we might revise the paragraph in question to read as follows: If we remember their laboratory experiences correctly (Dr. Aycock and his associates of the Harvard Infantile Paralysis Commission), it would seem that while intradermal injections of active virulent virus produced immunity in the majority of monkeys to subsequent intranasal applications and intracerebral inoculations of the active virus, such intradermal injections did not consistently produce immunity in the monkeys so treated. Furthermore, although the immunizing doses of living virus were sub-infective when given intradermally, they would have been rapidly infective if injected intracerebrally or even if applied intranasally. The point which we wished to make was that living virus was not a satisfactory immunizing agent.

This contention, we feel, finds additional support in the results of Dr. Rhoads' experiments. In his communication appearing in *Science* in 1930 there was described the use of filtrates of fresh, pooled, living monkey virus and of suspensions of glycerolated material of the same strain absorbed in both cases on aluminum hydroxide. The results following the treatment of *Macacus rhesus* monkeys with the preparations were reported by Dr. Rhoads as follows:

"The immunity thus induced was tested in three ways. First, glycerolated virus was repeatedly instilled into the nostrils. All the previously treated animals resisted infection, although the control developed typical poliomyelitis. The second test, carried out 28 days after the first, consisted of intracerebral inoculation of fresh virus. Of three animals so treated, one developed poliomyelitis, as did the control, and two resisted infection. The third test was made with the blood serum of the treated monkeys. Each of the three sera was tested separately and each neutralized the virus.

It may, therefore, be concluded that the virus, when absorbed on aluminum hydroxide, is incapable of producing poliomyelitis, but still capable of inducing active immunity in *Macacus rhesus*. In a small series of animals thus immunized, no symptoms of experimental poliomyelitis arose, and in one only was the degree of immunity, although adequate to protect against nasal instillation, insufficient to protect against intracerebral injection of virus. That all three treated monkeys developed immunity is shown by the serum neutralization tests."

In a subsequent communication, Dr. Rhoads described his immunization experiments on monkeys with living poliomyelitis virus neutralized by convalescent human serum. We quote from the discussion:

"The results of the experiments described in the foregoing protocols indicate that a varying degree of immunity to poliomyelitis can be induced in monkeys by the intradermal and subcutaneous injection of poliomyelitis virus neutralized by mixture with human convalescent serum. That the protection conferred by such treatments is not constant, or perhaps of high degree, is evident from the fact that only one-half of the treated animals survived the direct inoculation of virus. Furthermore, the serum of one of six survivors failed to neutralize a small quantity of poliomyelitis virus, although the remaining five effected complete inactivation. On the other hand, six of eight animals which remained well were retested by direct virus inoculation and proved resistant.

It is interesting to compare these experiments with the refractory state resulting from the subcutaneous inoculation of active virus studied by Stewart and Rhoads[1, 2], in which it was shown that four of eight treated animals were unable to resist direct intracerebral inoculation of rather weak virus strains. The foregoing experiments suggest that the production of immune bodies in certain animals may follow the injection of neutralized virus ineffective in producing disease symptoms when inoculated intracerebrally in normal monkeys."

While we regret any false impression that we may have caused by our original statement in regard to the results of the Harvard Infantile Paralysis Commission, we still firmly believe that the experimental evidence indicates that the immunity evoked by living virus has not yet been shown to be consistent or of a sufficiently high order to encourage

its use for any purpose other than for experimental study in the laboratory.

REFERENCES

1. Rhoads, C. P.: Immunization with aluminum hydroxide mixtures of poliomyelitis virus. Science **72**: 608 (Dec. 12) 1930.
2. Rhoads, C. P.: Immunity following the injection of monkeys with mixtures of poliomyelitis virus and convalescent human serum. J. Exper. Med. **53**: 115 (Jan. 1) 1931.

DIATHERMY IN LOBAR PNEUMONIA

Editor, *New England Journal of Medicine*,

In a letter published in your *Journal* Dr. Wetherbee wrote an answer to Dr. King's criticism of our paper[1], [2], [3] entitled "Diathermy in Lobar Pneumonia." Dr. Wetherbee's correspondence contained the following paragraph:

"Point 2 (dealing with the debatable question as to whether or not lung is heated by diathermy), I am referring to Dr. Resnik, the physiotherapist of the group, for anything he may care to say on the subject, or on any other subject in connection with Dr. King's letter." Dr. Wetherbee used the correct term "debatable". To the best of my knowledge to this date we have no absolute proof either for or against this contention. However, such proof was not our main concern, as may be seen from the following statement in our preliminary report: "In this discussion we are concerned neither with laboratory findings nor the underlying theories as much as we are interested in the actual clinical findings. The latter were gratifying[3]." We were satisfied both from our own limited experience in this series of cases as well as from a fairly extensive and well-representative literature on the subject that greater clinical improvement may be effected in the course of this disease when general medical care is coupled with the proper application of diathermy. Since the publication of our report, there appeared a paper entitled "Status of Diathermy in Pneumonia[4]" by Dr. Harry Eaton Stewart.

In this paper he quotes Dr. Marjorie Warren of West Middlesex Hospital, London, as follows: "For several winters the results were so favorable that the Directors fitted up a special diathermy ward for patients with pneumonia. Shortly after it was ready last winter it was used to capacity to serve patients from a Welsh labor group who had marched on London to petition Parliament. These workers arrived in the vicinity of London in a pitiful physical state. Undernourished, ragged, sleeping on the ground, they contracted pneumonia in large numbers. Of these unfavorable cases over fifty were treated with a mortality of three per cent. (The average mortality in England is somewhat greater than ours—about thirty-five per cent.) Dr. C. A. Robinson of the same hospital reporting on their cases as a whole gave a mortality of twelve per cent in a total of one hundred and seventy cases. As these figures covered several different epidemics over considerable time they present a fair picture of results. . . . It is now the established routine for all pneumonia cases."

"The following figures (table I) are reported from the Employees' Hospital of the Tennessee Coal, Iron and Railroad Company, Fairfield, Alabama, by Dr. Groesbeck F. Walsh:

Coal and Iron Railroad Company

		Recovered	Died	Mortality
Treated Cases	95	83	12	12.4 per cent
Controlled "	59	47	12	20.3 " "

Thus we could go on building up statistics, sufficient quantitatively and qualitatively to support the theory that the mortality is greatly reduced by this form of treatment. However, as mentioned above in our paper, we acted as impartial observers, reported facts as we found them, and stressed mainly the symptomatic relief obtained from diathermy (not at all to the exclusion of serum therapy or any other form of recognized treatment). As regards our mortality statistics we stated: "The number of cases is so small that the statistics especially must be regarded with suspicion, and we feel that our results are suggestive rather than conclusive[3]."

Dr. King charged us with an act of omission. He says: "In regard to the physiological changes which may be expected from the use of diathermy in pneumonia, the authors have not taken into account the very careful experimental work done by Drs. Binger and Christie at the Rockefeller Institute for Medical Research. Their experiments on animals and on three human subjects, while perhaps not conclusive, should be given an important place in the consideration of the use of diathermy in pneumonia[2]." I believe that Dr. King answered his own question when he used the following expression "while perhaps not conclusive". With all due regard to these two investigators, we must admit that their findings were neither inconsistent with our report of benefits derived from the use of diathermy in pneumonia, nor did they disprove the theory of local heating of the consolidated lung. May we quote Dr. Christie's own words: "Our work has been mainly confined to the physiologic effects of these currents, and we are not in a position to express any opinion as to their therapeutic value. We believe that diathermy is the best method of applying heat, if penetration to the deep tissues is desired[5]."

In their third original report, entitled "The Temperature of the Circulating Blood[6]", Binger and Christie voiced the following opinion: "This indicates that the lungs are being heated but that the blood passing through the pulmonary vessels is removing the heat at approximately the rate of production." It seems to me that this leaves very little doubt as to the fact that the lung tissue is heated locally, because heat like water would tend to flow from a higher point to a lower. Furthermore, Dr. King emphasizes the importance of this experimental work of Binger and Christie as being "very careful experimental work done". But Binger him-

self could not have considered it absolutely faultless when he wrote the following: "In the lungs of three patients suffering from lobar pneumonia no such local heating effect could be demonstrated. The discrepancy can be explained partly by the fact that, in the case of dogs, the anesthetic impeded the efficiency of the heat regulating mechanism, *partly by the particular relation of the thermocouple to the lesion which in these patients may not have been such as to demonstrate local heat storage.* The possibility of demonstrated local heating is not precluded by these observations[7]." Thus, we find Binger himself admitting uncertainty both in the technique of those experiments and in the conclusion that might be based on their findings. For he states that "*the possibility of demonstrating local heating is not precluded by these three observations.*" These two admissions alone punctured the balloon which they constructed to attack the theory of local heating. The support that their work may lend to the opponents of the use of diathermy in pneumonia, becomes even weaker in the light of the analysis of Dr. Stewart who was invited to assist in their study and who, as he puts it, feels that he is "in a position to know more than a cursory reading of the articles would afford[4]". Therein Dr. Stewart points to retractions on the part of the investigators.

Dr. N. E. Titus points as follows to the injurious effects produced by the reports of Drs. Binger and Christie: "In all electrical treatments, technique is most important and also the apparatus used must be suitable to produce the desired reaction. Binger and Christie *neglected both of these important factors*, and since they did not obtain results and their conclusions had the stamp of authority, diathermy as a rational aid in the treatment of pneumonia has suffered untold harm[4]." I am in favor of a laboratory check-up on the various phases of the practice of medicine. I do not feel, however, that laboratory men have a monopoly over the power of observation. Medicine is still emerging from empiricism. Was it not Sir Oliver Lodge, the great British scientist, who expressed his opinion to the effect, that laboratory investigations are only a couple of hundred years old while the human race has known of the existence of certain truths for thousands of years? Is it not in accordance with the best medical tradition that if in thousands of cases of diathermy in pneumonia improvement was observed clinically, we have a right to give the patients the benefit of this therapy? And we have this right, notwithstanding the fact that a very limited effort on the part of the laboratories has not succeeded as yet to determine the factors which are responsible for the valuable aid rendered by diathermy in the general medical care in the treatment of pneumonias. As long as nobody has demonstrated that diathermy has caused any harm, and as long as its application does not exclude any other form of recognized treatment, then it seems to me that the medical profession should be encouraged, rather than discouraged, to continue with its observations in this field, clinically as well as by laboratory investigations.

REFERENCES

1. Wetherbee, W., Jr.: A discussion of Dr. Donald S. King's criticism. New Eng. J. Med. **212:** 174 (Jan. 23) 1936.
2. King, Donald S.: Diathermy in lobar pneumonia. New Eng. J. Med. **213:** 1324 (Dec. 26) 1935.
3. Wetherbee, W., Jr.; Foley, J. A., and Resnik, J.: Diathermy in lobar pneumonia. A preliminary report. New Eng. J. Med. **213:** 796 (Oct. 24) 1935.
4. Physical Therapy, X-Ray and Radium. P. 98 (Feb.) 1936.
5. Binger, Carl A. L., and Christie, Ronald V.: Diathermy in pneumonia. J. A. M. A. **91:** 367 (Aug. 11) 1928.
6. Binger, Carl A. L., and Christie, Ronald V.: Experimental study of diathermy; temperature of circulating blood. J. Exper. Med. **46:** 595 (Oct. 27) 1927.
7. Binger, Carl A. L.: Principles and Practice of Physical Therapy. Hagerstown: W. F. Prior and Co., Inc. P. 22, 1933.

JOSEPH RESNIK, M.D.

184 Bay State Road, Boston.

RECENT DEATH

MacPHEE—L. LEE MACPHEE, M.D., of Glen Road, Wellesley, Massachusetts, with an office in Boston, died at the Hotel Commander in Cambridge, his winter home, March 13, 1936, after a short illness.

Dr. MacPhee was born in Somerville in 1888 and received his M.D. degree from the Tufts College Medical School in 1916. He was especially interested in gastro-intestinal diseases and early in his career engaged in postgraduate medical study in Edinburgh, Munich and Vienna.

Dr. MacPhee is survived by his widow, Mrs. Bernice (Grady) MacPhee; two sisters and a brother.

NOTICE

MEDICAL CLINIC AND STAFF ROUNDS AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 P.M. on Thursday, March 26, in the Amphitheatre of the Peter Bent Brigham Hospital, Dr. Henry A. Christian, Physician-in-Chief, Hersey Professor of the Theory and Practice of Physic in the Harvard Medical School, will give a medical clinic. To it are cordially invited practitioners and medical students.

On Saturdays in the wards of the Peter Bent Brigham Hospital, from 10 to 12, staff rounds will be conducted by Dr. Christian.

REPORTS AND NOTICES OF MEETINGS

NEW ENGLAND ROENTGEN RAY SOCIETY

The New England Roentgen Ray Society met at the Peter Bent Brigham Hospital, December 20, 1935, with Dr. A. S. MacMillan presiding. The program was presented by members of the staff of the Peter Bent Brigham Hospital.

Dr. William Vaughan presented the first paper of the evening, speaking on "Pituitary Tumors." He pointed out that while tumors of the posterior lobe of the pituitary are practically unknown, adenomas of the anterior lobe are of fairly frequent occurrence. These adenomas are designated as "chromophobe",

"acidophile", or "basophile", according to the staining properties of the type of the cell involved.

Acidophilic adenomata produce the clinical syndrome known as "acromegaly". Dr. Vaughan discussed the case history of an acromegalic patient who developed almost total blindness over a period of three years of the disease. He was given four x-ray treatments of three hundred r units each to the pituitary region, with restoration of normal vision within three months. Dr. Vaughan cited this as typical of the excellent results obtained from radiation of acidophilic adenomata.

The history of a patient with a chromophobe adenoma who suffered severe headaches and marked visual disturbances was presented. Two series of x-ray treatments to the pituitary resulted in abolition of the headaches, and great improvement of vision. Eighty per cent of such cases respond well to radiation therapy. Failure to respond is an indication that the tumor is cystic and an indication for surgical treatment. Cystic degeneration and appearance of radioresistance may result from radiation therapy.

The "Clinical Features of Pituitary Adenomas" were discussed by Dr. Max Schnitker. The chromophobe adenomas are twice as common as all other pituitary tumors combined. They are nonsecretory, and give no systemic symptoms until they become so large as to cause atrophy of other pituitary tissue, and secondary hypopituitarism with symptoms similar to those of Froehlich's syndrome. If the adenoma occurs in a child, pituitary dwarfism results. X-ray examination of these patients reveals a typical "balloon" sella turcica, which has resulted from the expanding tumor. Progressive enlargement usually occurs in the midline, and involves the optic chiasm with the production of a bitemporal visual field defect, and, eventually, if untreated, in total blindness. Occasionally growth occurs laterally, and the temporal lobe of the cerebrum is involved with interruption of the optic radiation and homonomous hemianopsia. Choked optic discs and elevated intracranial pressures are rarely encountered in these tumors, and do not occur unless there is invasion of the ventricles.

Hypopituitarism manifests itself in obesity, laziness, easy fatigability, fine silken hair, and a low basal metabolic rate. Headaches may be very troublesome, but usually disappear entirely if the tumor breaks through the sella turcica. Ninety per cent of these cases seek medical advice because of slowly progressing visual defects.

Acidophilic adenoma, or diffuse increase in the number of acidophilic cells in the pituitary, results in gigantism, if occurring in the prepubertic period, and in acromegaly if occurring after puberty when the epiphyses are closed. These patients show acromegalic features, overgrowth of hair, profuse perspiration, elevation of basal metabolic rate, glycosuria, polydipsia and polyuria. Females show irregularities of menses, and males may become impotent. The sella turcica is dilated in approximately ninety per cent of the cases. Headaches are a more troublesome feature in this group than in the chromophobe type of tumor, although visual disturbances are not so commonly encountered.

Determination of visual field changes are an important method of following progression of pituitary tumors, and of determining the efficacy of radiation therapy.

All chromophobe adenomata should be given a trial series of x-ray treatments before surgical measures are resorted to. The most widely used surgical approach to the pituitary is the transfrontal route, and well-handled cases show a mortality rate of only five per cent.

Studies of the response of hypopituitary patients to hormonal medication have been ambiguous. Although the basal metabolic rate is low in such cases, there is no elevation produced by administration of desiccated thyroid in massive doses. One case with extreme lassitude was treated with injections of "Antuitrin S", without results. Subsequent administration of "Antuitrin G", however, resulted in marked subjective improvement.

Dr. Merrill C. Sosman spoke on "Pituitary Basophilism." Basophilic adenomata are very rare, and produce very striking signs and symptoms, because of their great secretory activity. Such tumors usually occur between the ages of fifteen and twenty-one years, and are more frequently found in females than in males. In a series of sixteen cases the average duration of life from onset was five years. Such patients usually show a marked adiposity of trunk and face, which spares the limbs; there is great overgrowth of hair, and excessive pigmentation of the skin. Amenorrhea develops, a low basal metabolic rate is produced, hypertension is characteristic, and there is acralcyanosis, striae distensae, hyperglycemia, and polycythemia. X-ray shows diminished density of the bones similar to that observed in hyperparathyroidism. Most of such patients die with carbuncles, or skin infections. Dr. Sosman reported two cases which showed very striking regression of symptoms, and clinical improvement from radiation therapy.

Dr. Joseph C. Aub discussed "The Clinical and Metabolic Changes Occurring in Pituitary Tumors." He pointed out that such tumors seem to produce systemic symptoms by stimulating the other glands of the body to hyperactivity. The rôle of the pituitary in carbohydrate metabolism, however, is antagonistic to that of the pancreas. Experimental removal of the pituitary results in marked increase in ability to metabolize carbohydrates, and enhances the efficacy of insulin. Ablation of both pituitary and pancreas results in mild hyperglycemia without acidosis, but restoration of the pituitary to these animals causes severe diabetes, and death from acidosis.

Studies of the calcium metabolism were made in one of the cases of basophilism reported by Dr. Sosman. During the active stage of the disease the bones showed marked decalcification, and although the blood calcium levels were normal, the calcium

output was five times that of a normal individual of the same age and weight. Following treatment and clinical improvement the calcium output dropped until at present it is but fifty per cent of the normal value. The excretion of phosphate was practically unchanged either in the active disease or following treatment.

The basal metabolic rate of this patient, which had been low before treatment, is now within normal limits. The sugar tolerance curve before treatment was of diabetic type, but after therapy carbohydrate intake causes elevation to no more than eighty milligrams per cent, an abnormally small rise.

Dr. W. N. Myhre spoke on "Teleoroentgen Treatment of Leukemia". The average life span of an individual with untreated chronic myelogenous leukemia is between one and a half and two and a half years, and spontaneous remissions are rare, occurring in only seven per cent of cases. With radiation therapy life expectancy is increased thirty per cent, and remissions are induced in fifty per cent of the cases. Methods of radiation therapy have included the local radiation of the spleen, long bones and chest, and autotransfusion with irradiated blood. Such methods have given similar results. In the past twenty months forty-seven cases of chronic myelogenous leukemia have been treated with the "spray", or teleoroentgen method at the Brigham Hospital. Small doses of radiation are given to the anterior and posterior surfaces of the whole body, only the head being shielded. The drop in white count seems to be directly proportional to the area of body surface so treated. Treatments are continued daily until the white count has been lowered to between ten and twenty thousand. The drop continues after cessation of treatment until the levels are seven to eight thousand. Coincident with the drop in the white count, there is an increase in the red blood cells. Radiation sickness does not occur in these cases, and remissions so induced are of greater degree and longer duration than those obtained from local treatment.

Dr. William P. Murphy remarked that the treatment of leukemia should be directed toward the relief of symptoms and reduction of lymphoid hyperplasia. The rise in the red count noted after spray treatment is probably due to relief of a previously "overcrowded" bone marrow. Between series of radiation the red count and hemoglobin should be kept well up with large doses of iron and intramuscular liver. Cases of anemia secondary to leukemia fail to show response to iron and liver except immediately after radiation.

After spray treatment the white count rises markedly (even doubles) within twenty-four or forty-eight hours. This rise is perhaps due to the production of maturation of the leukemia cells, allowing their entry to the blood stream in large numbers. This observation raises the question of whether leukemia is a deficiency disease similar in some respects to pernicious anemia.

Dr. George W. Holmes stated that in his experience results obtained from the use of "spray" x-ray during the past five years had not been so satisfactory as those reported from the Brigham Hospital. Radiation sickness occurs after any form of x-ray therapy if the dosage employed is large enough. It may be prevented by using small divided dosages over a prolonged period of time.

NEW ENGLAND HEART ASSOCIATION

The New England Heart Association met January 6, 1936, at the Peter Bent Brigham Hospital, Dr. Samuel A. Levine presiding. The first paper of the evening was presented by Dr. J. G. Gibson, 2nd, on the subject "A Method of Determining the Blood Volume." A modification of the dye method of determining the plasma volume developed by Gregersen, Gibson and Stead (Am. J. Physiol. 113: [Sept.] 1935) was described.

Three sources of error exist in the Keith-Rowntree technique: (1) due to colorimetry of turbid solutions (plasma); (2) due to hemolysis; and (3) due to variability of time required for complete mixing of injected dye, which is determined by total volume and velocity rate of the blood, occurs normally in seven minutes, and is prolonged in cardiac failure.

These errors are eliminated by (1) the use of the spectrophotometer; (2) the use of the blue dye T-1824 (Evans): having maximum light absorption at the wave length of least absorption of hemoglobin; and (3) by determining the mixing time and disappearance rate of the dye and thus the theoretical dilution value at which all the dye is mixed with all the blood before any dye has disappeared, or any blood has been withdrawn.

The technique permits frequent repeated determinations, since errors due to residual dye from previous injections are canceled out by the spectrophotometer.

T-1824 is nontoxic, does not pass the "blood-brain barrier", and hence gives a true value for total plasma. Plasma volumes as encountered clinically may range from 2000 cc. (myxedema) to 6600 cc. (congestive failure).

Dr. William A. Evans, Jr., spoke on "Blood Volume Changes in Congestive Heart Failure." The blood volume in normal individuals was found subject to wide variation when expressed either in absolute quantity or in proportion to body weight. To determine the changes occurring in congestive failure two methods were used. (1) Groups of individuals representing different degrees of decompensation were compared statistically, and (2) observations were made on individuals during recovery from congestive failure.

Group I contained those individuals with organic heart disease, but no evidence of failure, and a normal venous pressure and circulation time. In Group II the subjects had dyspnea and limited activity but no signs of congestive failure. In Group

III the subjects had both signs and symptoms of failure, and a venous pressure below 150 mm. In Group IV were the severely decompensated patients with a venous pressure above 150 mm. In Groups I and II the average blood volume did not differ materially from the normal, while in Groups III and IV the average figure was increased by 20 per cent and 60 per cent, respectively.

All patients studied during recovery from decompensation exhibited a diminution in blood volume proportional to the degree of recovery. The greatest loss observed was 3780 cc. in one week. At first the loss in plasma is greater than the loss in red cells, while later the reverse occurs.

Dr. Soma Weiss pointed out that this work has definitely disproved the concept of two types of congestive failure, one in which there is an increased blood volume, and the other in which there is a decreased blood volume. All cases of congestive failure are characterized by an increased volume.

Dr. Michel Pijoan discussed "The Mechanism of Hypertensive Crises." Studies were made of the blood pressure and blood sugar responses following the intravenous administration of fifteen units of insulin in normal individuals, patients with essential hypertension and with Addison's disease. In twenty-five normals the blood sugar fell to a level of forty milligrams per cent without any appreciable changes in blood pressure. A sharp rise in blood pressure averaging forty millimeters of mercury, systolic, and seven millimeters of mercury, diastolic, then occurred. The blood sugar rose ten milligrams per cent, and gradually returned to the fasting level. In twenty cases of essential hypertension the initial fall in blood sugar was to an average of forty milligrams per cent; blood pressure remained constant, but then suddenly rose sharply fifty millimeters of mercury systolic, and twenty-two millimeters diastolic; at this point the blood sugar rose twenty milligrams per cent. Four patients with Addison's disease had an initial drop in blood sugar of fifteen milligrams per cent, which was sustained for two hours with a gradual rise in the next three hours with no changes in blood pressure.

In normal dogs following intravenous insulin (one unit per kilo.) there occurs a drop in blood sugar from ninety milligrams per cent to twenty-five milligrams per cent without changes in blood pressure, then there is a sharp rise in both systolic and diastolic tensions (from 125 mm. to 200 mm. of mercury systolic and from 80 mm. to 120 mm. of mercury diastolic) with a rise in blood sugar of fifteen milligrams per cent. Following adrenalectomy the fall in blood sugar was sustained at a level of twenty-five milligrams per cent for one and one-half hours with a subsequent rise to normal, with no changes in blood pressures.

It was concluded that insulin hypoglycemia calls for a secretion of adrenin which is responsible for the sudden elevation in blood pressure. The response of the hypertensive to the secretion of adrenin accompanying recovery from hypoglycemia is excessive, whereas there is no response in the patients with Addison's disease.

Dr. Weiss stated that injection of adrenin in the hypertensive patient causes hyperactivity of the parasympathetic system rather than the sympathetic system, and that there is a resultant drop in blood pressure, and not an elevation and crisis. Dr. Pijoan replied that if adrenin is incubated with homologous serum for several hours before injection, it will cause a rise in blood pressure.

"Hemopericardium as a Cause of Sudden Death" was discussed by Dr. Marshall N. Fulton. Twenty-four instances of hemopericardium among the 3400 autopsied cases at the Peter Bent Brigham Hospital were reviewed. There were fourteen patients who died of rupture of the ventricle subsequent to coronary occlusion. In all but one of these, rupture took place within seventeen days from the onset of symptoms. There were four instances of dissecting aneurysm which bled into the pericardial sac, three of mycotid aneurysm with intrapericardial rupture, two of hemopericardium following pericardial tap, and one of so-called "spontaneous rupture" of the aorta. No cases due to trauma were encountered. The amount of blood contained within the pericardium was generally less than 500 cc. Death, in these patients, generally was sudden though not instantaneous, there usually being a period of collapse lasting two to fifteen minutes before death occurred. In one instance of rupture of the ventricle and two of dissecting aneurysm this period lasted for hours, the patients dying gradually. The diagnosis of hemopericardium may be suspected in a patient known to have one of these types of cardiac or aortic lesions who suffers collapse and dies within a brief period, usually within two to fifteen minutes.

"The Early Diagnosis of Aortic Stenosis" was the subject of Dr. Samuel A. Levine's address. Some years ago the diagnosis of aortic stenosis was made much too frequently. Many basal systolic murmurs which were eventually found to be benign or which accompanied nonvalvular disease of the heart were misinterpreted as due to aortic stenosis. There then followed a period of skepticism about the significance of the systolic murmur, and it was taught that aortic stenosis was a very rare condition. In fact one of the most noted authorities on heart disease in a recent book stated that this lesion is rare. Postmortem studies, on the contrary, show that stenosis of the aortic valve is almost as frequent as of the mitral, but that in many cases the diagnosis is overlooked.

A fairly certain diagnosis of aortic stenosis can be made if one finds a loud harsh systolic murmur and systolic thrill at the base of the heart, especially in the aortic area. The finding of calcification of the valve on fluoroscopic examination is practically pathognomonic. However, the valve will be stenosed for years before either a thrill will become palpable or calcification visible. A review of sixteen cases of definite aortic stenosis seen in pri-

vate practice, in which the diagnosis eventually was made, but which were previously seen and not properly diagnosed, has convinced Dr. Levine that this lesion must be suspected or diagnosed even in the absence of a thrill when a loud harsh systolic murmur (grade three or louder) is heard at the base of the heart. Occasionally the systolic murmur will be as loud or louder at the apex than in the aortic area. This is particularly true in the absence of hypertension, for when the latter is present and occasionally under other circumstances, a loud basal systolic murmur may be present without aortic stenosis.

Dr. A. W. Contratto reported on "Aortic Stenosis, Syncope, Angina Pectoris, and Sudden Death." The study was undertaken in an attempt to determine if there was any relationship between aortic stenosis, carotid sinus irritability and syncope and sudden death, or between aortic stenosis, angina pectoris and sudden death. One hundred and sixty cases of aortic stenosis were studied. Of this number one hundred were males, and sixty were females. In this series fifty were autopsied cases. The average age of the patients in this series was fifty-one years. Eleven of the fifty-two cases in which the form of death was known died suddenly.

Syncope was a common complaint in twelve per cent of the cases. Marked vertigo was a prominent symptom in an additional ten per cent. No cause of the frequent occurrence of syncope in patients with aortic stenosis was determined. Fifteen patients with aortic stenosis were studied for carotid sinus irritability with negative results.

A large incidence of precordial pain was found in this series, twenty per cent having definite angina pectoris, and twelve per cent having prominent precordial pain not characteristic of angina pectoris. Angina pectoris was as common in patients having aortic stenosis without aortic insufficiency as it was in those patients having aortic stenosis with some degree of aortic insufficiency. Six of the eleven cases that died suddenly in this series had angina pectoris. Also in studying the autopsy material in fifty cases, a large incidence of coronary sclerosis was found. Thus, it was felt that a large proportion of patients with aortic stenosis who die suddenly, die with angina pectoris.

"Is Digitalis Present in Body Fluids in Digitalized Patients?" was the topic of the paper delivered by Dr. Maurice A. Schnitker. It was noted that some patients complained of weakness, headache, nausea, and occasionally vomiting following salyrgan diuresis. If digitalis acting substances can be demonstrated in edema fluid, the mechanism may be that the patient is re-digitalized with a rapid elimination of fluid. Analyses were made of pleural and ascitic fluid from seven digitalized patients in which the fluid was known to have accumulated while digitalis was being taken. For controls, similar fluids from four patients known to have had no digitalis were used. A precipitate obtained by treating the fluid with alcohol, extracting with chloroform, reëxtracting with ether-petroleum-benzin was suspended in Clark's solution. This was tested in the Straub frog heart preparation.

The effects recorded on a kymograph, compared with standard curves of digitalis, showed very suggestive evidence of digitalis bodies in the seven digitalized fluids. In none of the controls was a digitalis-like effect observed. With digitalized fluid, recovery of the heart could not be obtained by washing, or by atropine. These measures caused recovery with non-digitalized fluids. Chemical tests, though not specific, have shown only two positive of six tests. These observations furnished suggestive, but not conclusive, evidence that digitalis is present in body fluids of digitalized patients.

TRUDEAU MEDICAL SOCIETY

The annual open meeting of the Trudeau Medical Society was held in the Beth Israel Hospital on the evening of February 11. Dr. Richard H. Overholt presided.

Dr. Max Pinner spoke on "The Diagnostic and Prognostic Significance of Positive and Negative Sputum." Dr. Pinner pointed out several exceptions to the usual rule that the finding of a positive sputum makes the diagnosis of pulmonary tuberculosis. In the first place patients may have tuberculosis with a positive sputum, but there may also be another more important disease present; secondly, a positive sputum may come from tuberculous lesions in the tonsils or larynx without any pulmonary tuberculosis, although these cases are rare; thirdly, in compensation and insurance cases, patients may secure positive sputum from other people and pass it off as their own; fourthly, there are about twenty-five species of acid-fast organisms in sputa which are not tubercle bacilli, and these may be isolated only by culture and guinea pig inoculation. For this reason, whenever there is a discrepancy between the clinical and laboratory findings, the bacilli should be carefully cultured. With these exceptions a positive sputum means active positive pulmonary tuberculosis.

Less than one per cent of active pulmonary tuberculous patients have negative sputum when the sputum is studied by direct smear, concentration methods, culture or inoculation. For this reason, failure to find the tubercle bacilli in the sputum practically excludes active pulmonary tuberculosis. Negative sputum, contrary to the statement of many textbooks, has definite diagnostic significance, and Dr. Pinner showed slides of several x-rays to demonstrate this point. However, in the hematogenous, nonmiliary, diffuse pulmonary tuberculosis the sputum is negative. In the series which Dr. Pinner presented, only nine out of five hundred sputa had to be cultured or inoculated into guinea pigs to show the presence of the tubercle bacilli. In all the other cases they were found either by direct smear or by concentration methods. The most reliable criterion for a closed cavity is a negative sputum. Dr. Pinner pointed out the im-

portance of carefully instructing the patient in a language which he understands, how to cough, expectorate and save his sputum. Failure to do this often leads to false negative sputa.

Dr. Pol N. Coryllos discussed "The Closure of Cavities." He showed numerous slides to demonstrate his theory as to how cavities become obliterated. He believes that the bronchus which connects the cavity with the trachea becomes at first partially closed and later completely closed. In the period when it is only partly closed, local emphysema and ballooning result. When it is completely closed, an atelectasis takes place, the air is absorbed and the cavity collapses. He further believes that the closing of the bronchus, by causing the oxygen tension to fall and the carbon-dioxide tension to rise in the cavity, retards the growth of the tubercle bacilli as well as stimulates fibrosis. Dr. Pinner closed the meeting with a brief rebuttal to Dr. Coryllos's theory, maintaining that in the few cases where known healed cavities have been studied at autopsy, the bronchi extended into the middle of the scar which could not occur if the above theory were correct.

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

A stated meeting of the Essex South District Medical Society was held on Wednesday, March 4, 1936, at the Lynn Hospital.

An instructive and interesting clinic was held at 5 P.M., followed by a dinner at 7 P.M. and an evening meeting.

The guest speaker, Dr. Timothy Leary, was unavoidably detained from attending, and the large number of physicians, who were present, will still look forward to his address on the subject of Arteriosclerosis.

Dr. Bernard Appel of Lynn addressed the meeting and very ably and instructively presented the subject of "Various Aspects of Syphilis."

NATHANIEL POPE BREED, M.D., *Reporter.*

THE BOSTON DISPENSARY

25 Bennet Street

CLINICAL STAFF MEETING

A luncheon meeting of the Clinical Staff of the Boston Dispensary will be held on Tuesday, March 31, 1936, in the Auditorium on the second floor of the Dispensary building, at 12 o'clock.

At 12:30 P.M. the staff of the Tumor Clinic will conduct a symposium on the following subjects:

Cancer of Lip. Dr. Edward A. Cooney.

Cancer of Tongue and Floor of Mouth. Dr. Roy E. Mabrey.

Cancer of Tonsil and Nasal Pharynx. Dr. LeRoy A. Schall.

X-Ray Treatment of Oral Cancer. Dr. Charles E. Dumas.

Discussion from the floor to be opened by Dr. William M. Shedden.

An invitation is extended to any who are interested in the subject. Luncheon to non-members 35c.

OLIVER G. TINKHAM, M.D., *President,*
LOUIS E. WOLFSON, M.D., *Secretary.*

THE AMERICAN ASSOCIATION ON MENTAL DEFICIENCY

The American Association on Mental Deficiency composed of some 500 educators, psychologists, sociologists, and psychiatrists will hold its sixtieth annual meeting at the Hotel Jefferson, St. Louis, Mo., on May 1, 2, 3 and 4. The Friday sessions will be devoted to General and Sociological Aspects of Mental Deficiency; the Saturday sessions to Psychological and Educational topics with special stress on Educational Disabilities. The Monday sessions will be given over to Research Activities, Medical Aspects and Administrative Problems in Mental Deficiency.

The speakers include the following: Popenoe on "Sterilization", Goddard on "Social Security", Hincks on "A National Program", Kirkbride on "Public Welfare", Hackbusch on "Social Service", Vanuxem on "Education", Berry on "Teaching Techniques", Humphreys on "Research Problems", and many others. Everyone interested in the mentally defective or retarded child is cordially invited to attend these sessions. The complete program may be obtained from the Secretary, Dr. Groves B. Smith, Godfrey, Illinois.

MASSACHUSETTS GENERAL HOSPITAL

A Clinical Meeting of the Staff of the Massachusetts General Hospital will be held in the Moseley Memorial Building, on Thursday, March 26, at 8:15 P.M.

PROGRAM

1. Lyndau's Disease. John Hodgson, M.D.
2. Operative Treatment of Syringomyelia. W. J. Mixter, M.D.
3. Blood Loss in Cranial Operations. J. C. White, M.D.
4. Hypertension. Reginald Smithwick, M.D.

Physicians, medical students, nurses and social workers are cordially invited.

Committee on Hospital Meetings,
WILLIAM B. BREED, *Chairman,*
MARSHALL K. BARTLETT, *Secretary.*

BOSTON CITY HOSPITAL

CLINICAL MEETING OF FIFTH SURGICAL SERVICE AND SURGICAL RESEARCH LABORATORY

Wednesday, March 25, 1936, at 8:15 P.M.
Cheever Amphitheatre

1. Cross Circulation Studies in Surgical Shock: Dr. Stanley J. G. Nowak.
2. Renal Colic in the Male Caused by Vesiculitis: Dr. Augustus Riley.
3. Arterial Embolism: Dr. Charles C. Lund.

4. Gangrene and Impending Gangrene of the Extremities: Considerations and Treatment: Dr. E. Everett O'Neil.
5. Dietetic Problems Associated with Total Gastrectomy: Drs. W. B. Castle and Irving J. Walker.
6. End Results of Total Thyroidectomy for Chronic Intractable Heart Disease: Dr. David D. Berlin.

COMMITTEE ON HOSPITAL CLINICS.

TUFTS COLLEGE MEDICAL SCHOOL ALUMNI ASSOCIATION

The Annual Dinner of the Tufts College Medical School Alumni Association will be held Wednesday, March 25, 1936, at Hotel Somerset, Boston, at 7:00 P.M.

The Annual Business Meeting will be held at 6:00 P.M.

The alumni, faculty, students and friends of the school are cordially invited to attend.

ROBERT T. PHILLIPS, M.D., *Secretary.*

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Boston Lying-in Hospital, Monday, March 23, 1936, at 8:15 P.M.

PROGRAM

1. Angiogenesis in the Early Human Placenta. Dr. Arthur T. Hertig.
2. Report of Studies in Progress on:
   A. The Visualization of Superficial Veins in Pregnant Women by Infra-Red Photography.
   B. Blood Volume Changes During Pregnancy and the Puerperium. Dr. A. Hirsheimer.
3. Observations on the Physiology of the Circulation in Pregnancy:
   A. The Velocity of Blood Flow in Normal and Abnormal Pregnant Women. Dr. Mandel E. Cohen.
   B. Studies on Vital Capacity and Venous Pressure in Normal and Abnormal Pregnant Women. Dr. K. J. Thomson.
4. Observations on Lead 5 of the Electrocardiogram in Pregnancy. Dr. K. J. Thomson.
5. "Cardiac Asthma" and Acute Pulmonary Edema as a Complication of Non-Convulsive Toxemia of Pregnancy. Dr. Harold M. Teel.
6. Causes of Death of Cardiacs in Pregnancy. Dr. Burton E. Hamilton.

Discussion by Doctors C. Sidney Burwell and Soma Weiss.

All members of the New England Heart Association and interested physicians are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary.*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Shattuck Street Entrance), Tuesday evening, March 24, at 8:15 P.M.

PROGRAM

Presentation of Cases.

The Genesis of Thyroid Proteins. By Dr. William T. Salter.

Magnesium Metabolism in Health and Disease. By Dr. Joseph C. Aub.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MARCH 23, 1936

Monday, March 23—

*8:15 P.M. New England Heart Association. Boston Lying-in Hospital.

Tuesday, March 24—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. X-Ray Demonstration. Dr. Alice Ettinger.

2:30 P.M. Pediatric Ward Visit. Massachusetts Eye and Ear Infirmary.

*8:15 P.M. Harvard Medical Society. Peter Bent Brigham Hospital Amphitheatre (Shattuck Street Entrance).

Wednesday, March 25—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Electrosurgery of the Abdomen. Dr. Lester Whitaker.

†12 M. Clinico-Pathological Conference. Children's Hospital.

6 P.M. Tufts College Medical School Alumni Association. Annual Meeting. Hotel Somerset, Boston.

7 P.M. Tufts College Medical School Alumni Association. Dinner. Hotel Somerset, Boston.

8:15 P.M. Boston City Hospital, Clinical Meeting. Cheever Amphitheatre.

Thursday, March 26—

*8:30-9:30 A.M. Clinic, Surgical and Orthopedic Staffs of Children's Hospital, at the Children's Hospital.

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Blood Clinic. Dr. I. Olef.

*3:30 P.M. Medical Clinic at the Peter Bent Brigham Hospital.

8:15 P.M. Massachusetts General Hospital. Clinical Meeting of the Staff.

Friday, March 27—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Problems in the Etiology of Rheumatic Fever. Dr. T. Duckett Jones.

12 M. Massachusetts General Hospital. Clinical Meeting of the Staff of the Children's Medical Service. Ether Dome.

Saturday, March 28—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Presentation of District Cases. Dr. Joseph Rosenthal.

*10-12. Staff rounds at the Peter Bent Brigham Hospital.

*Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

March 23—New England Heart Association. See notice elsewhere on this page.

March 24—Harvard Medical Society. See notice elsewhere on this page.

March 25—Boston City Hospital, Clinical Meeting. See page 610.

March 25—Tufts College Medical School Alumni Association. See notice elsewhere on this page.

March 26—Medical Clinic, Peter Bent Brigham Hospital. See page 605.

March 26—Massachusetts General Hospital. See page 610.

March 30—Springfield Medical Association, 8:30 P.M. at the rooms of the Springfield Academy of Medicine, 20 Maple Street. The Development of Surgical Practice in Springfield. Dr. John M. Birnie.

March 31—Boston Dispensary Clinical Staff Meeting. See page 610.

April 8—Joint Meeting of the Massachusetts Tuberculosis League and the Hampden County Tuberculosis and Health Association. See "An address by Dr. Kendall Emerson." Page 498, issue of March 5.

April 10—William Harvey Society. Beth Israel Hospital. P.M.

April 20-24—A Postgraduate Institute in Philadelphia. See page 497, issue of March 5.

May 1, 2, 3, and 4—The American Association on Mental Deficiency. See page 610.

May 12-16—The International Congress of Physical Medicine. See page 443, issue of February 27.

June 15-19—The Executive Board of the Catholic Hospital Association will meet at the Fifth Regiment Armory, Baltimore, Md.

June 16-July 28—Summer Course in Bacteriology. See page 385, issue of February 20.

September, 1936—First International Conference on Fever Therapy. See page 1325, issue of December 26, 1935.

September 7-10—International Union against Tuberculosis. See page 554, issue of March 12.

October 19-23—Clinical Congress of the American College of Surgeons. See page 180, issue of January 23.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

April 1—Wednesday. Essex Sanatorium, Middleton. Clinic 5 P.M. Dinner 7 P.M. Speaker: Dr. Richard H. Overholt of the Lahey Clinic. Subject: Chest Surgery.

May 7—Thursday. Censors' Meeting.

May 13—Wednesday. Annual Meeting. Salem Country Club. Dinner at 7 P.M. Speaker: Dr. Paul White. Subject to be announced later.

R. E. STONE, M.D., Secretary.

88 Lothrop Boulevard, Beverly.

FRANKLIN DISTRICT MEDICAL SOCIETY

May 12—Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary.

Sunderland.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

May 6—Bear Hill Golf Club, Stoneham, at 12:15 P.M.

K. L. MACLACHLAN, M.D., Secretary.

1 Bellevue Avenue, Melrose.

NORFOLK DISTRICT MEDICAL SOCIETY

March 31—Hotel Kenmore, at 8 P.M. Dr. Benedict F. Boland—Cauterization of the Cervix Uteri Using Various Electrical Methods. Illustrated with lantern slides.

May—Annual Meeting. (Place, date and subject to be announced.)

The censors meet for the examination of candidates: May 7, 1936; November 5, 1936.

FRANK S. CRUICKSHANK, M.D., Secretary.

1236 Beacon Street, Brookline.

PLYMOUTH DISTRICT MEDICAL SOCIETY

March 19—Plymouth County Sanatorium, South Hanson.

April 16—Brockton Hospital.

May 21—Lakeville State Sanatorium.

G. A. MOORE, M.D., Secretary.

167 Newbury Street, Brockton.

SUFFOLK DISTRICT MEDICAL SOCIETY

April 29—Annual Meeting at the Boston Medical Library. The Treatment of Septicaemia, Dr. Champ Lyons. The Pleurality of Scarlatinal Streptococcus Toxin, Dr. Sanford B. Hooker. Discussion: Dr. Hans Zinsser.

The medical profession is cordially invited to attend this meeting.

ROBERT L. DeNORMANDIE, M.D., President,
CHARLES C. LUND, M.D., Secretary.

WORCESTER DISTRICT MEDICAL SOCIETY

April 8—Wednesday evening. Hahnemann Hospital, Worcester, Mass. Dinner and scientific program. Subjects of program to be announced later.

May 13—Wednesday afternoon and evening. Annual Meeting of Society. Time, place and details of program to be announced in an April issue of the Journal.

ERWIN C. MILLER, M.D., Secretary.

27 Elm Street, Worcester.

BOOK REVIEWS

A Textbook of Clinical Neurology with an Introduction to the History of Neurology. Third Edition. Reset. Israel S. Wechsler. 826 pp. Philadelphia and London: W. B. Saunders Company. Cloth, $7.00 net.

The second edition of this well-known textbook was reviewed in The *New England Journal of Medicine*, February 25, 1932. At that time the reviewer stated that the book was "the best short American neurology today and thoroughly up to date". With the appearance of a third edition, four years later, the reviewer sees no reason to change his opinion. As a matter of fact, the book is improved. It has been largely rewritten and a good many parts deleted; new references and illustrations have been used. Contrary to most new editions of textbooks, this one has reduced the number of pages rather than added to them, if one leaves out a new section added to this edition on the history of neurology. In this final chapter on the history of neurology Dr. Wechsler has covered the field very briefly but with a good deal of completeness. Due to the fact that this chapter covers only about thirty-five pages, it became necessary to refer to only the most important men and their contributions. There is a partial list of references appended. This chapter supplements the previous important contribution on the subject by the late F. H. Garrison in Dana's textbook of neurology.

Aphasia. A clinical and psychological study. Theodore H. Weisenburg and Katharine E. McBride. 634 pp. New York: The Commonwealth Fund. $5.00.

No student of aphasia, nor any practitioner desiring to be familiar with the best and latest work in this field, can afford to be without this volume.

The manuscript for the book was completed shortly before Dr. Weisenburg's death and could well stand as a monument to his scientific, careful, and painstaking research.

The work offers a revised classification of aphasic disorders and contributes much of value regarding the methods applicable in examination, diagnosis, prognosis, and treatment.

The Bacteriology of Typhoid, Salmonella, and Dysentery Infections and Carrier States. Leon C. Havens. 157 pp. New York: The Commonwealth Fund. $1.75.

This monograph on the bacteriology of the typhoid-salmonella-dysentery group gives complete and useful information from the standpoint of the laboratory worker regarding this important group of microörganisms. Abundant references help to give further leads for those interested in a more detailed study of the group. Not only is the laboratory angle presented, but a practical presentation of the epidemiological problems as well.